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An Analysis of Post-NGPA Interstate Pipeline Wellhead Purchases

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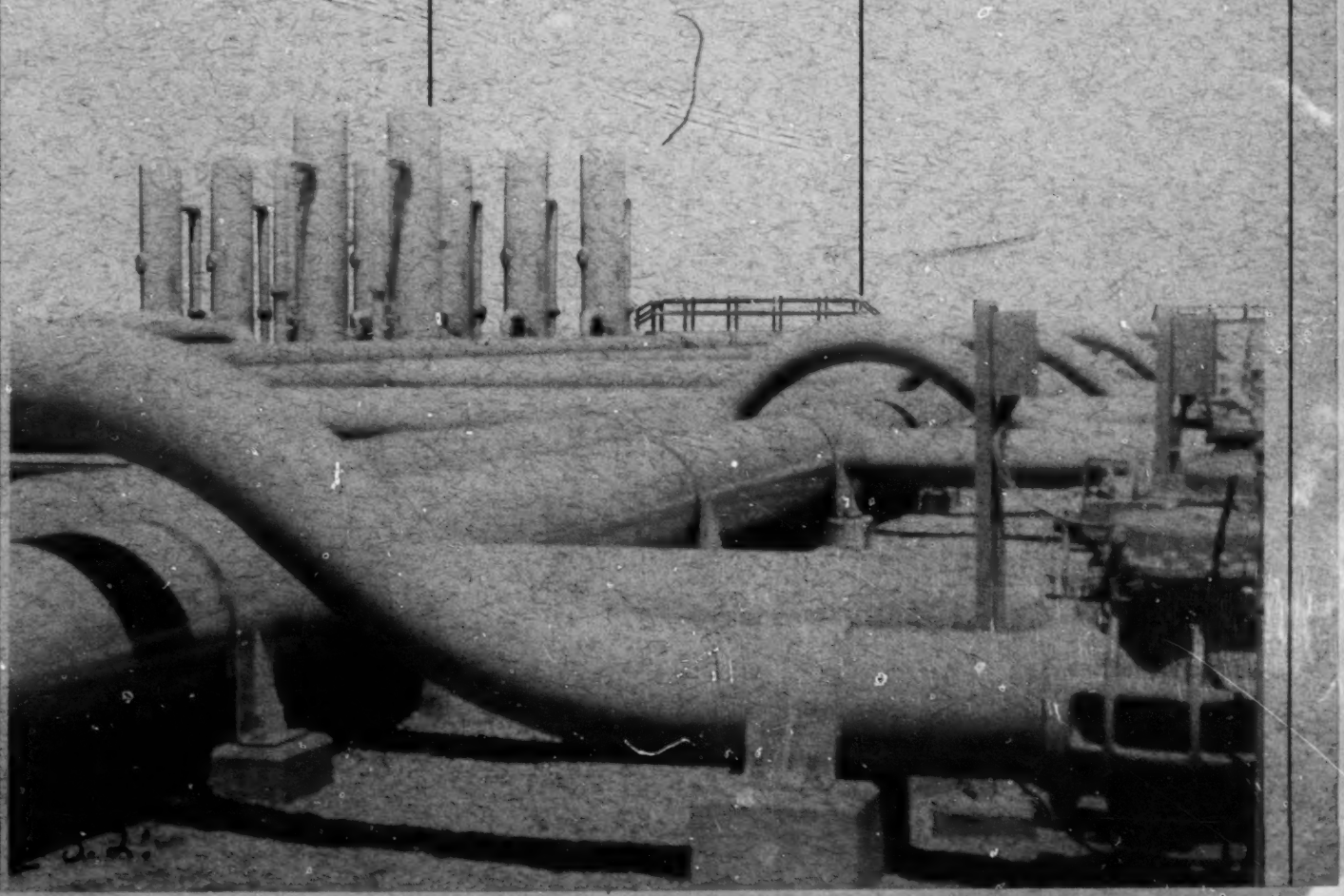

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Energy Information Administration
Office of Oil and Gas
U.S. Department of Energy

September 1982

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Preface

This report is the third part of the Energy Information Administration's (EIA) comprehensive study of the Natural Gas Policy Act of 1978 (NGPA) and several alternative policies. It is intended for those interested in following the natural gas market under the NGPA. Part I was published in December 1981 and presented a wide variety of information on the current state of the natural gas market. Part II, published in June 1982, analyzed natural gas producer/purchaser contract terms and their potential influences on the market. A fourth part will analyze the effects of the NGPA and several alternatives through 1990.

This report is principally devoted to an analysis of pricing for various NGPA categories of wellhead natural gas purchases. The primary data source for such information is the Purchased Gas Adjustment (PGA) filings that major interstate pipeline companies submit to the Federal Energy Regulatory Commission (FERC). Twenty major pipeline companies are included in the study. Three PGA submissions are analyzed for each company, covering eighteen months of 1981 and 1982.

The authors would like to acknowledge the assistance provided by the FERC Office of Pipeline and Producer Regulation, directed by Kenneth Williams, the FERC Office of Regulatory Analysis, directed by Robert Means, and the Division of Energy Deregulation, Office of Policy Planning and Analysis, directed by Catherine Good Abbott, for their thorough review of the report.

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Executive Summary

The Natural Gas Policy Act of 1978 (NGPA) established a number of pricing categories for natural gas purchased at the wellhead and set price ceilings for most categories. In one important case -- natural gas from deep wells covered by NGPA Section 107 -- price ceilings were eliminated altogether on November 1, 1979; for other categories, the price ceilings rise over time.

The purpose of this report is to analyze the market for natural gas at the wellhead as seen by major interstate pipeline companies. Among the issues addressed are:

- What volumes of the various categories of natural gas are being purchased by interstate pipeline companies and what prices are being paid?
- How much variation is there among companies in their average purchase prices of gas? How has the variation changed during the past year?
- Is there any evidence that old gas supplies are being "reclassified" to take advantage of higher price ceilings on new gas categories?
- What explains the volumes and prices of high-cost (Section 107) gas purchases?

The data for the analysis presented here come from the Purchased Gas Adjustment (PGA) filings submitted by major interstate pipeline companies to the Federal Energy Regulatory Commission. The purpose of the PGA is to allow interstate pipeline companies to recover the difference between their anticipated actual purchase costs for natural gas and the costs reflected in their current rate structure. The key data in the PGA filings are projections of purchases and costs for the immediate future by each of the 20 major interstate pipeline companies. For this report, PGA filings for three 6-month periods, mid-1981, winter 1981-82, and mid-1982, were analyzed.

Rather than discussing each of the NGPA categories individually, this report groups them into four major classes:

- Old gas, composed of all gas covered by NGPA Sections 104 (old interstate) and 106 (rollover contracts). Old gas is in general the lowest priced grouping.
- New gas, composed of all gas covered by NGPA Sections 102 (new gas), 103 (gas from new onshore production wells), 108 (stripper well gas), and 109 (certain other supplies).
- High-cost gas, composed of all gas covered by NGPA Section 107. The majority of these purchases are not subject to price control, and are priced at levels substantially above those that apply to other groupings.
- Miscellaneous, composed of small volumes of gas classified as intrastate or covered by NGPA Sections 311 and 312.

As can be seen from Table ES1 and Figure ES1, total projected purchase volumes increased slightly (2 percent) between mid-1981 and mid-1982, accompanied by a more significant increase (17 percent) in the average of projected wellhead prices. Most

Table ES1. Projected Natural Gas Wellhead Purchase Volumes and Prices for Major Interstate Pipeline Companies, 1981-1982 (Volumes in Billion Cubic Feet; Prices in Constant January 1982 Dollars per Thousand Cubic Feet)

Type of Gas	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
	Average Volume[b]	Price	Average Volume[b]	Price	Average Volume[b]	Price
Old Gas (Sections 104 and 106)	6,348	1.24	6,068	1.27	5,803	1.29
Vintage Through 1972	3,535	0.89	3,286	0.91	3,054	0.91
Vintage After 1972	2,587	1.73	2,548	1.72	2,610	1.71
Vintage Unknown	226	1.11	234	1.41	139	2.10
New Gas[c]	3,347	2.96	3,610	3.01	3,825	3.09
Section NGPA 102	1,992	3.04	2,161	3.11	2,342	3.20
Section NGPA 103	1,060	2.79	1,128	2.80	1,184	2.86
Section NGPA 108	185	3.45	199	3.51	194	3.64
Section NGPA 109	111	2.36	123	2.32	106	2.41
High-Cost Gas (Section 107)	390	6.12	517	7.33	664	7.24
Miscellaneous[d]	85	2.60	64	2.52	60	2.87
Total Projected[e]	10,170	2.01	10,260	2.19	10,352	2.35

[a]Exact dates covered differ from company to company (see Appendix A). The effective dates of the PGA filings fall within the following intervals:
Mid-1981, January 1 through June 30, 1981;
Late 1981 - Early 1982, July 1 through December 31, 1981;
Mid-1982, January 1 through June 30, 1982.

[b]Volumes are given at an annual rate.

[c]Total new gas includes that covered by NGPA Sections 102, 103, 108, and 109.

[d]Includes Sections 105, 311, and 312.

[e]Summary volumes and prices for each type of gas have been imputed for certain companies at certain times in order to make the totals comparable. The affected companies are as follows:
Mid-1981, Kansas-Nebraska and El Paso for subcategories of old gas;
Late 1981 - Early 1982, Colorado, Kansas-Nebraska, and Northern for all categories, Michigan-Wisconsin and El Paso for old gas subcategories;
Mid-1982, Michigan-Wisconsin for old gas subcategories only.

Note: Totals may not sum due to independent rounding.

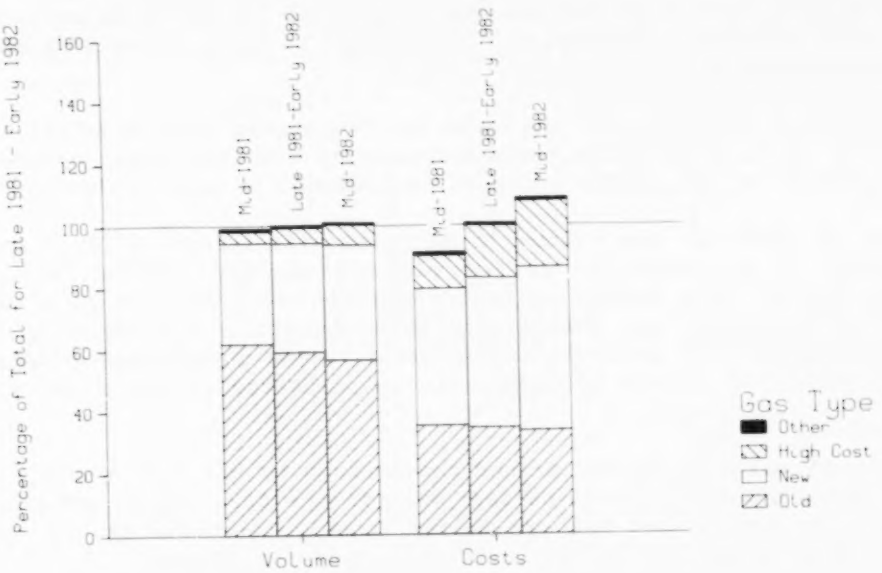
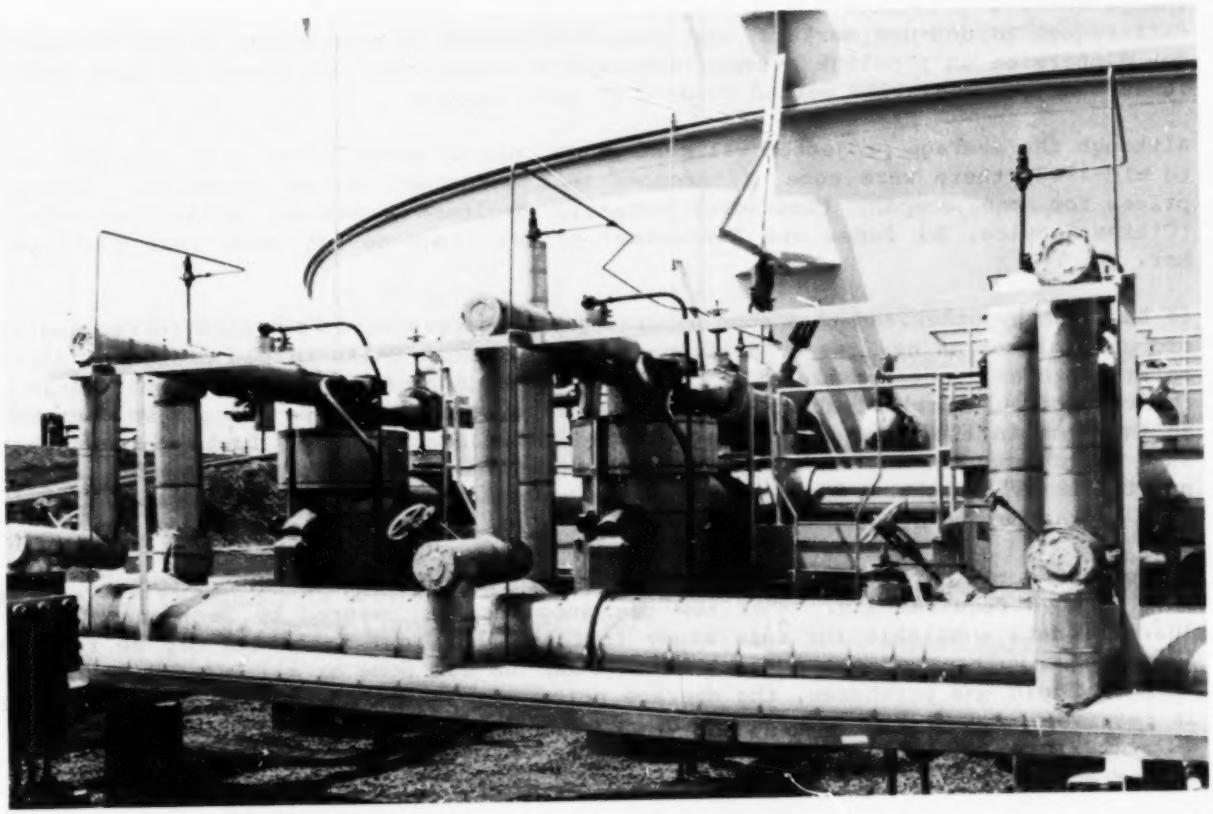


Figure ES1. Wellhead Purchase Volumes and Expenditures for Major Interstate Pipeline Companies, 1981-1982



of the increase in average prices was due to a shift of purchases away from the old gas to the more expensive categories, rather than to major price increases with individual gas categories.

Although purchases of high-cost gas grew by 70 percent from mid-1981 to mid-1982, they still are small in absolute terms and account for less than 7 percent of total wellhead purchases by the pipeline companies included in this analysis.

The behavior of high-cost gas prices is of particular interest. In contrast to the modest increase of projected prices for old and new gas, prices of high-cost gas rose rapidly during 1981, peaked in early 1982 and then declined slightly. Despite the peaking of high-cost gas prices, the price is still so high that increases in purchased volumes in 1982 contributed to the increase in average wellhead purchase costs, even though the volume of high-cost gas purchases is quite small in absolute terms.

The variation of wellhead prices around the average is noticeably different for the three major gas groupings, as can be seen from Figure ES2. While the projected purchase prices for old and new gas are fairly tightly clustered in one or two areas, prices for high-cost gas vary broadly across a range of prices.

Considerable variations also exist in the projected average wellhead price across companies, as can be seen in Table ES2. Since pipeline companies often serve different market areas, direct competition at the burner-tip (that is, final consumption) is limited. This may account in part for the continuing disparity in prices and purchasing practices among companies. These differences may also arise from differences in end-use markets, and from differences in endowments of pre-NGPA gas. The dispersion in pipeline average acquisition costs does not appear to have diminished over the 1981-1982 period covered in this report.

Although the average projected wellhead price rose by about 17 percent from mid-1981 to mid-1982, there were some differences in the changes across companies. Average prices for one company (Southern) actually declined somewhat, while for others (Cities Service, El Paso, and Tennessee) prices increased by more than $0.50 per Mcf.

It has been hypothesized that some natural gas producers have been able to reclassify old gas volumes as new gas by drilling new development wells in old fields -- often referred to as "category creep." If producers had engaged in such reclassification, the result would probably be a greater than expected decrease in old gas volumes and an increase in the volumes of new gas sold under Section 103. To the extent that such an effect can be estimated, the data examined and presented in this report provide no evidence that there has been any substantial degree of gas reclassification in the period studied.

All pipeline companies have purchased new gas in recent years because all face long-term reserve requirements. Most new gas supplies are covered by Sections 102 and 103. The data available for this study indicate that four variables may be related to purchase volumes of gas subject to Section 102 for some or all PGA filings: the volume of old gas purchases, the average price of old gas purchases, the difference in reserves between 1977 and 1980, and curtailments experienced during the winter of 1976-1977.

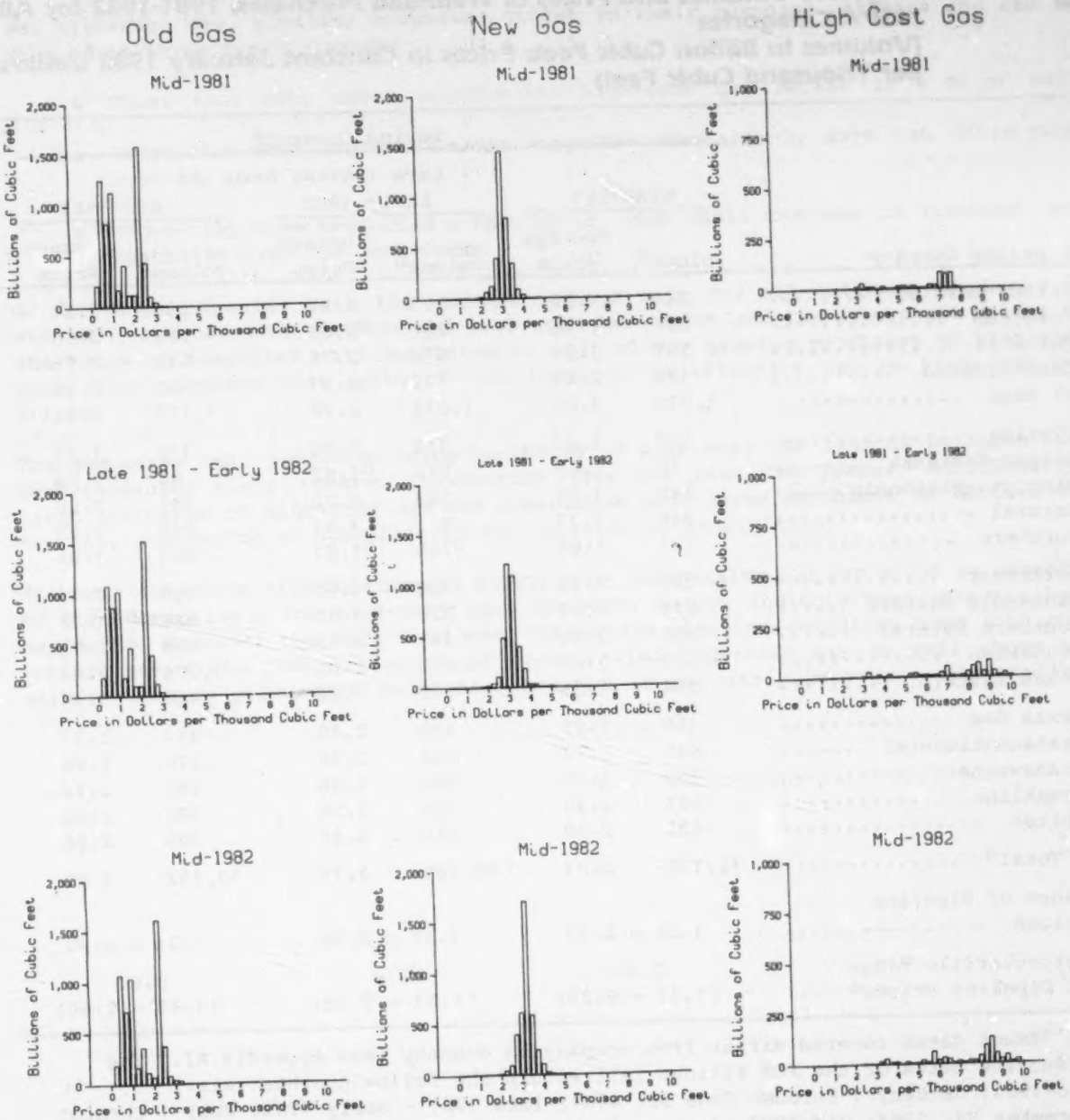


Figure ES2. Distribution of Wellhead Purchase Prices by Time Period and Type of Gas for Major Interstate Pipeline Companies, 1981-1982

Table ES2. Projected Volumes and Prices of Wellhead Purchases, 1981-1982 for All NGPA Categories
(Volumes in Billion Cubic Feet; Prices in Constant January 1982 Dollars per Thousand Cubic Feet)

	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
Pipeline Company	Volume[b]	Average Price	Volume[b]	Average Price	Volume[b]	Average Price
Cities Service	344	1.54	303	1.97	236	2.21
Colorado	281	2.36	[c]287	[c]2.48	292	2.60
Columbia	597	2.29	678	2.76	633	2.75
Consolidated	104	2.42	102	2.51	102	2.58
El Paso	1,015	2.00	1,013	2.28	1,132	2.55
Florida	137	1.91	132	1.88	118	1.92
Kansas-Nebraska	76	1.69	[c]70	[c]1.82	63	1.98
Michigan-Wisconsin	540	1.93	583	2.20	547	2.29
Natural	848	1.77	863	1.81	900	1.92
Northern	727	1.68	[c]705	[c]1.81	683	1.95
Northwest	135	1.97	156	1.90	162	2.14
Panhandle Eastern	511	1.57	520	1.65	524	1.77
Southern Natural	453	2.59	445	2.73	458	2.53
Tennessee	1,037	1.87	1,075	2.08	1,094	2.43
Texas Eastern	554	1.20	509	1.32	485	1.34
Texas Gas	468	1.95	459	2.20	451	2.27
Transcontinental	849	2.77	844	2.78	879	2.90
Transwestern	269	1.80	268	1.96	297	2.12
Trunkline	591	2.40	578	2.55	589	2.64
United	633	2.18	670	2.40	705	2.56
Total[d]	10,170	2.01	10,260	2.19	10,352	2.35
Range of Pipeline Prices	1.20 - 2.77		1.32 - 2.78		1.34 - 2.90	
Interquartile Range of Pipeline Prices[e] ...	0.52 (1.77 - 2.29)		0.74 (1.81 - 2.55)		0.60 (1.95 - 2.60)	

[a]Exact dates covered differ from company to company (see Appendix A). The effective dates of the PGA filings fall within the following intervals: mid-1981, January 1 through June 30, 1981; late 1981 - early 1982, July 1 through December 31, 1981; mid-1982, January 1 through June 30, 1982.

[b]Volumes are shown at an annual rate.

[c]Volumes and prices are averages of first and third submissions for companies that report annually (and so have no second submission).

[d]Total wellhead gas purchases includes miscellaneous sections not included in any category report (Sections 311 and 312) and slight volumes for which no section was reported or imputed.

[e]Interquartile range refers to the central 50 percent of volumes.

Note: Totals may not sum due to independent rounding.

Executive Summary (continued)

For high-cost gas, pipeline companies differ in their purchase patterns and can be grouped in three broad classes:

- Those that have never entered the high-cost gas market in a major way.
- Those that have increased their projected purchases by more than 50 percent over the past year.
- Those that have projected a decline or only small increase in high-cost gas purchases over the past year.

Of the five companies with the highest average cost for all wellhead purchases in mid-1981, one has never entered the high-cost gas market and the others all belong to the group of companies with declining or only slowly growing purchases of high-cost gas. This suggests that market forces have put an effective cap on high-cost gas prices.

The companies that projected large purchases of high-cost gas tend to be those that have increased their reserve inventories over the past few years. Additionally, large purchases of high-cost gas are associated with large purchases of Section 102 new gas, suggesting an overall strategy of reserves acquisition.

Although companies with substantial supplies of inexpensive old gas might be expected to bid aggressively for high-cost gas, the data do not indicate that that has been happening. However, the fact that most interstate pipeline companies have some controlled gas means that the price of decontrolled high-cost gas is well above the market clearing price that could be sustained if all gas prices were decontrolled.

1. Introduction

Purpose of Study

The Natural Gas Policy Act of 1978 (NGPA) restructured Federal regulatory policy for the natural gas industry. Among its goals were to allow the price of newly developed gas to rise gradually to free market levels by 1985 and to encourage the development of certain high-cost sources of gas. To further these objectives, the NGPA established a number of pricing categories for natural gas purchased at the wellhead and price ceilings for most categories. The price ceilings for most gas developed before the passage of the NGPA are low compared to the incentive prices for other categories of gas. The price ceilings for most gas developed after the NGPA are higher; for much new gas the ceiling is being allowed to rise more rapidly than the inflation rate. In one important case -- high-cost gas from deep wells covered by Section 107 -- price ceilings were eliminated altogether on November 1, 1979.

Although the NGPA places a ceiling price on most first sales of natural gas, it does not dictate prices. The price ceilings constrain prices to remain below specified levels; but other forces help determine the actual prices paid. For instance, the terms of contracts dated before the NGPA are sometimes more restrictive than the NGPA price ceilings and take precedence. Similarly, the price of decontrolled gas is determined not by the NGPA but by the bidding behavior of the pipeline companies and the supply available.

Since 1978, NGPA regulation of wellhead prices has nonetheless provided the basic structure for the interstate natural gas market at the wellhead and strongly influenced prices at the burner-tip. The resulting wellhead gas market has a number of unusual features. For instance, some pre-NGPA natural gas is purchased for as little as $0.21 per thousand cubic feet (Mcf) because it is subject to long-term contracts with no price escalation clauses. On the other hand, some decontrolled gas supplies have been purchased for over $9.00 per Mcf because pipeline company selling prices are based on average rather than marginal acquisition costs and because most gas supplies have been priced at levels far below those of competing fuels.

Moreover, interstate pipeline companies differ both in their endowments of pre-NGPA gas and in their requirements for new (more expensive) supplies. As a result, the average acquisition price for natural gas can and does vary considerably from one purchasing pipeline company to another. The burner-tip (final consumption) market for gas has not as yet forced pipeline companies to reduce acquisition cost disparities, in part because of limited competition and long-term contractual obligations, and in part because of differences in the nature of the companies' burner-tip markets.

In any case, there is considerable uncertainty about current market conditions and their relationship to the NGPA. This report uses available data to address a number of these uncertainties, including:

- What are the major determinants of average interstate pipeline company acquisition costs?
- How much variation in prices is there among contracts and among interstate pipeline companies?
- What explains the prices paid and volumes purchased of decontrolled (high-cost) gas?
- How has the interstate market changed over the past year?

Introduction (continued)

The condition of the wellhead gas market has also given rise to a number of more specific conjectures, two of which are considered here:

- Have interstate companies with unusually large endowments of old gas bid aggressively for the limited supplies of decontrolled gas?
- Have some interstate companies found it possible to reclassify some of their gas from less to more expensive categories?

Overview of the Report

The remainder of the introduction describes data sources used for the study and the basic method of subdividing overall gas supplies used in the rest of the report. Chapter 2 examines purchases of gas by NGPA Section and contract vintage. Chapter 3 reports the purchase behavior of individual pipeline companies. Chapter 4 summarizes the public positions taken by pipeline companies in their Annual Reports about a number of major policy issues. Chapter 5 summarizes the results. Appendix A describes in detail the data sources for the study and the transformations performed on the data to make them compatible. Appendix B presents individual profiles of each pipeline company involved in the study. Appendix C presents a summary of the sources of natural gas supply for individual interstate pipeline companies.

Purchased Gas Adjustment Filings

The most comprehensive sources for data relevant to the analysis presented here are the Purchased Gas Adjustment (PGA) filings submitted by major interstate pipeline companies to the Federal Energy Regulatory Commission (henceforth, the Commission), pursuant to 18 CFR 154.63. The purpose of the PGA is to allow interstate pipeline companies to adjust their rates to reflect changes in the cost of purchased gas. To allow timely recovery of such costs, the key data reported in the PGA are projections of purchases in the immediate future based on prior experience. PGA filings are subject to review for prudence and reasonableness in formal rate proceedings, but the Commission generally permits the filings to become effective on the proposed date. The rates are, however, frequently made subject to future refund to allow the Commission to review the filings fully.

The PGA filings consist of two rate adjustments, one to recover projected future costs, and a surcharge adjustment to correct for divergences between prior projections and actual experience. These adjustments have ranged from -18 to +37 cents per Mcf and can affect the time pattern of price changes for particular pipelines (see Appendix A). Therefore, care should be taken in interpreting price increases.

The PGA's were instituted in 1972 in an effort to regularize the treatment of changes in purchased gas costs. Initially, the PGA's were regarded as a convenience to allow relatively frequent adjustment of rates to account for purchase cost changes without the expense of a full cost-of-service study. Supporting data were reports of actual purchases in some recent time interval.

Since the passage of the NGPA, PGA's have become increasingly important in setting rates. Purchase costs have risen far more rapidly than other costs. In order to allow companies to recover changes rapidly, rates are now adjusted on the basis of

projected purchases. Any errors are corrected through a later surcharge adjustment.

In most cases, companies report the following data for each projected purchase:

- Commission account number
- Volume
- Price
- NGPA category
- Contract date
- Geographic source.

In addition, each files information needed to compute the surcharge adjustment.

Appendix A contains a full description of the PGA filings and the various data transformations necessary to make the filings of different companies compatible. A few general features of the data should be noted here, however.

Although 61 pipeline companies submit PGA filings, only 20 companies are included in this study. These 20 companies account for more than 87 percent of total wellhead purchases in the interstate market.

Three PGA filings are included for most companies. They report projected behavior over 18 months in 1981 and 1982 for each company. Most also report actual behavior. The time periods for different companies do not coincide precisely with each other. (See Appendix A for a full discussion.) Three companies report annually instead of semi-annually. Only two reports are used for these companies, corresponding to the first and third submissions of other companies. Data for an intermediate period have been imputed when it is necessary to compare totals across time periods.

Volumes reported as PGA totals include purchases at the wellhead, from field lines, and from gas plants. (For convenience, these will normally be referred to as wellhead purchases.) The volumes do not include purchases from other pipeline companies, exchange gas, liquefied or synthetic natural gas, imports, or cost-of-service gas produced from a company's owned reserves. The PGA data reported here represent a specific part of the natural gas market: wellhead purchases of interstate gas subject to the pricing provisions of the NGPA.

All prices reported from the PGA were converted to and are presented in constant January 1982 dollars (see Appendix A). They include the price paid to the producer, including gathering and transportation charges, and taxes. They do not include royalty payments or payments for gas not received under take-or-pay clauses.

Other Data Sources

The PGA data have been supplemented by data from four other sources:

- FERC Form 2, "Annual Report for Natural Gas Companies, Classes A and B"

- FERC Form 15, "Annual Report of Gas Supply for Certain Natural Gas Pipeline Companies"
- FERC Form 16, "Report of Gas Supply and Requirements"
- A survey of annual stockholder reports of major interstate pipeline companies.

A full description of these data sources can be found in Appendix A.

Major Gas Groupings

For purposes of this study, gas contracts have been grouped on the basis of the NGPA Section to which they are subject, and their contract dates, as follows:

- Old gas, composed of all gas covered by NGPA Sections 104 (old interstate) and 106 (rollover contracts). Old gas is in general the lowest priced grouping. Many old gas prices are influenced as much by the terms of the specific contract as they are by NGPA provisions. The vintage of the gas (that is, the date on which the well was spudded) determines the NGPA subcategory for the gas and hence is a major determinant of price. For this study, old gas supplies are subdivided according to contract dates because gas vintage information is generally unavailable. In the majority of cases, contract date and gas vintage are similar. Old gas is divided as follows in this study:
  - Old gas with a contract date of 1972 or earlier
  - Old gas with a contract date of 1973 or later
  - Old gas without a known contract date.
- New gas, composed of all gas covered by NGPA Sections 102 (new gas), 103 (gas from new onshore production wells), 108 (stripper well gas), and 109 (certain other supplies). Note that Section 108 is included in the new gas group because its price behavior resembles that of other new gas categories, but the volumes covered are small and do not affect summary statistics substantially. In many of the analyses that follow, the new gas grouping is subdivided into its constituent NGPA Sections.
- High-cost gas, composed of all gas covered by NGPA Section 107. About 60 percent of these purchases are not subject to price control, and almost all are priced at levels substantially above those that apply to other groupings.
- Other gas supplies, composed of small volumes of gas classified as intrastate or covered by NGPA Sections 311 and 312.

2. Purchases and Prices by NGPA Category

There are three major overall trends for the 20 pipeline companies for the three time periods under study, as shown in Table 1 and Figure 1:

- Projected wellhead purchases increased slightly (about 2 percent) between the first report and the third.
- Average projected wellhead prices (in constant dollars) increased by 17 percent between the first report and the third, in roughly equal installments.
- The increased overall projected wellhead price is due primarily to the shift of gas purchases to more expensive categories as old gas purchases decline, rather than to price increases within individual gas categories.

Old Gas

The volume of old gas purchases was projected to decline during the past year by 545 Bcf (about 9 percent of the first period volume). Most of this decrease (481 Bcf) would come from contracts dating from 1972 and before. The purchased volumes of later dated old gas have remained virtually constant. As a result, the percent of earlier old gas to all old gas has shrunk from 58 to 54 percent. The decline of earlier vintage old gas supplies reflects in part the natural result of contract expirations, natural depletion, and some of the gas from older wells obtaining stripper status. In addition, because old gas is substantially cheaper than any other category of gas and is dedicated to a specific pipeline company, purchases can be adjusted to help control the overall average purchase cost for a company over time.

Projected prices for major groupings of old gas have remained highly stable in real terms, changing by only about 2 percent each, which may well be due to the variations in the method used in constructing the data. The relative prices of the two groupings have therefore also remained steady, with gas from post-1972 contracts slightly less than twice as expensive as that from earlier contracts. The increase in old gas prices overall (about 4 percent) is due almost entirely to the decline in earlier and less expensive supplies. Had the ratio of volumes between the two types remained unchanged, the price of old gas overall would have increased very slightly.

New Gas

The pipeline companies have projected increases in their purchases of the two major categories of new gas (those covered by Sections 102 and 103 of the NGPA) substantially during the past year. Purchases of gas under Section 102 have risen somewhat more rapidly (18 percent) than those covered under Section 103 (12 percent). Other categories included in this major grouping account for only a relatively small percentage of new gas purchases. Their volumes have not changed substantially.

Overall, new gas purchases have increased by 477 Bcf, balancing about 88 percent of the decline in old gas supplies. The result has been a substantial change in the relative importance of new and old gas purchases. In the first period, new gas purchase volumes amounted to 53 percent of old gas purchases; the corresponding figure for the last period is 66 percent.

Purchases and Prices by NGPA Category (continued)

Table 1. Projected Natural Gas Wellhead Purchase Volumes and Prices for Major Interstate Pipeline Companies, 1981-1982.
(Volumes in Billion Cubic Feet; Prices in Constant January 1982 Dollars per Thousand Cubic Feet)

	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
Type of Gas	Volume[b]	Average Price	Volume[b]	Average Price	Volume[b]	Average Price
Old Gas (Sections 104 and 106)	6,348	1.24	6,068	1.27	5,803	1.29
Vintage Through 1972 ..	3,535	0.89	3,286	0.91	3,054	0.91
Vintage After 1972	2,587	1.73	2,548	1.72	2,610	1.71
Vintage Unknown	226	1.11	234	1.41	139	2.10
New Gas[c]	3,347	2.96	3,610	3.01	3,825	3.09
Section 102	1,992	3.04	2,161	3.11	2,342	3.20
Section 103	1,060	2.79	1,128	2.80	1,184	2.86
Section 108	185	3.45	199	3.51	194	3.64
Section 109	111	2.36	123	2.32	106	2.41
High-Cost Gas (Section 107)	390	6.12	517	7.33	664	7.24
Miscellaneous[d]	85	2.60	64	2.52	60	2.87
Total Projected[e]	10,170	2.01	10,260	2.19	10,352	2.35

[a]Exact dates covered differ from company to company (see Appendix A). The effective dates of the PGA filings fall within the following intervals: mid-1981, January 1 through June 30, 1981; late 1981 - early 1982, July 1 though December 31, 1981; mid-1982, January 1 through June 30, 1982.

[b]Volumes are given at an annual rate.

[c]Total new gas includes that covered by NGPA Sections 102, 103, 108, and 109.

[d]Includes Sections 105, 311, and 312.

[e]Summary volumes and prices for each type of gas have been imputed for certain companies at certain times in order to make the totals comparable. The affected companies are as follows: mid-1981, Kansas-Nebraska and El Paso for subcategories of old gas; late 1981 - early 1982, Colorado, Kansas-Nebraska and Northern for all categories; Michigan-Wisconsin and El Paso for old gas subcategories; mid-1982, Michigan-Wisconsin for old gas subcategories only.

Note: Totals may not sum due to independent rounding.

Purchases and Prices by NGPA Category (continued)

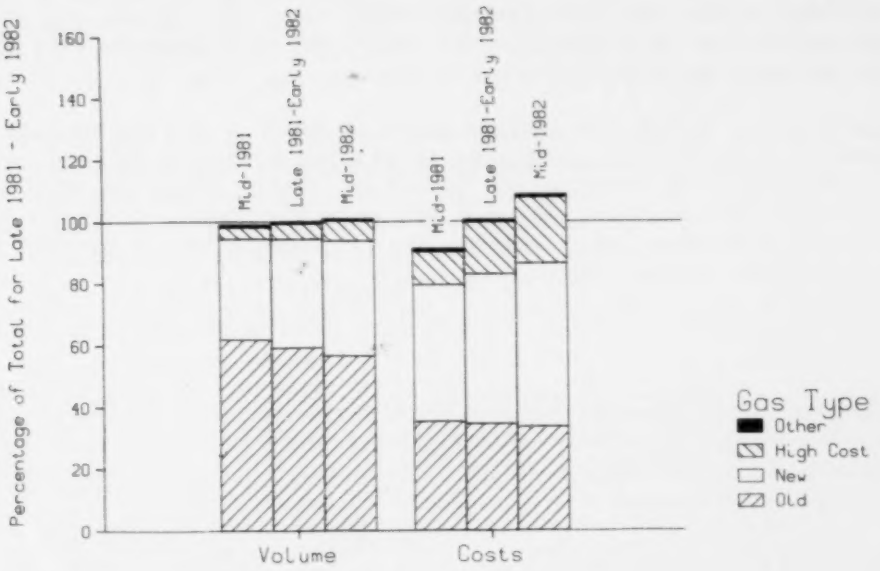


Figure 1. Wellhead Purchase Volumes and Expenditures for Major Interstate Pipeline Companies, 1981-1982

Purchases and Prices by NGPA Category (continued)

Changes in the average price for new gas reflect primarily the cost of additional purchases of Section 102 gas, the largest constituent of the new gas grouping. The price of gas covered by NGPA Section 102 has risen by 5 percent over the year; the price of new gas overall has risen by 4 percent.

The NGPA specifically allows the ceiling price of Section 102 gas to rise more rapidly than inflation. By contrast, ceiling prices for both old gas and gas covered by Section 103 have ceilings tied to the inflation rate. When the NGPA was enacted, the price ceilings for Sections 102 and 103 were the same. There is now a fairly large difference in average price between the two categories, 9 percent in the first period and 12 percent in the last.

New gas prices (primarily Sections 102 and 103) show much less price variation than prices for other gas supplies (see Table 2 and Figures 2 and 3). This is true for all study periods examined. The most probable explanation of this result is that new gas prices are governed primarily by NGPA price ceilings, while other gas prices are subject to a variety of other institutional and market forces. In particular, many old gas contracts are subject to more diverse ceiling rates or have rate limitations, while much high-cost gas is subject to no ceiling price.

High-Cost Gas

Purchases of high-cost gas have been projected to rise rapidly in volume. Purchases in the last period studied were expected to be 70 percent greater than those reported a year earlier. Nonetheless, volumes have remained relatively low in absolute terms. Even in the last period, high-cost gas accounted for less than 7 percent of total wellhead purchases by the pipeline companies reported here. The absolute increases in volumes have remained stable. The second period showed a 127 Bcf increase over the first; the third period showed a 147 Bcf increase over the second.

Despite the low volumes accounted for by high-cost gas, the category is of particular importance for natural gas market analysts for two reasons:

- The price of some high-cost gas is free to seek market-clearing levels. The prices reported for high-cost gas should be interpreted with caution, however. Because pipeline sales prices are based on average acquisition costs, and because most gas supplies are priced at low levels, the small volumes of high-cost gas have been "bid up" to prices above a general market-clearing level for a completely decontrolled market.

- High-cost gas contributes disproportionately to total pipeline company expenditures on natural gas purchases, because of its high price. This means that high-cost gas purchases exercise a strong influence over average costs for gas, even when purchase quantities are low. Figure 1 shows the relationship between volumes and expenditures on major groupings of gas.

In light of these considerations, the behavior of high-cost gas prices over the past year is of particular interest. In contrast to the other gas groupings, high-cost gas prices show a marked change in behavior during the past year. Between the first two periods, the price increased rapidly (at a rate of 40 percent annually); between the second and third periods, however, high-cost gas prices declined slightly (2 percent annual rate). This apparent peaking of high-cost gas prices late in 1981 or

Purchases and Prices by NGPA Category (continued)

early in 1982 is supported by the recent decisions of at least three pipeline companies to invoke market-out clauses on their high-cost gas contracts [see reference 2]. Under contracts with market-out provisions one company will buy no high-cost gas at a price over $5.00 per Mcf; another will buy none at more than $6.00 per Mcf.

Despite the recent decline in high-cost gas prices, the price of such supplies remains so high on average that additional purchased volumes continue to contribute to increased average gas purchase prices. Thus, companies are expected to spend 11.7 percent of their total wellhead purchase expenditures on high-cost gas in the first time period, 16.9 percent in the second, and 19.8 percent in the third. High-cost gas price variation has been high for all study periods; by most measures, it appears to have reached a peak during late 1981 or early 1982 (see Figures 2 and 3).

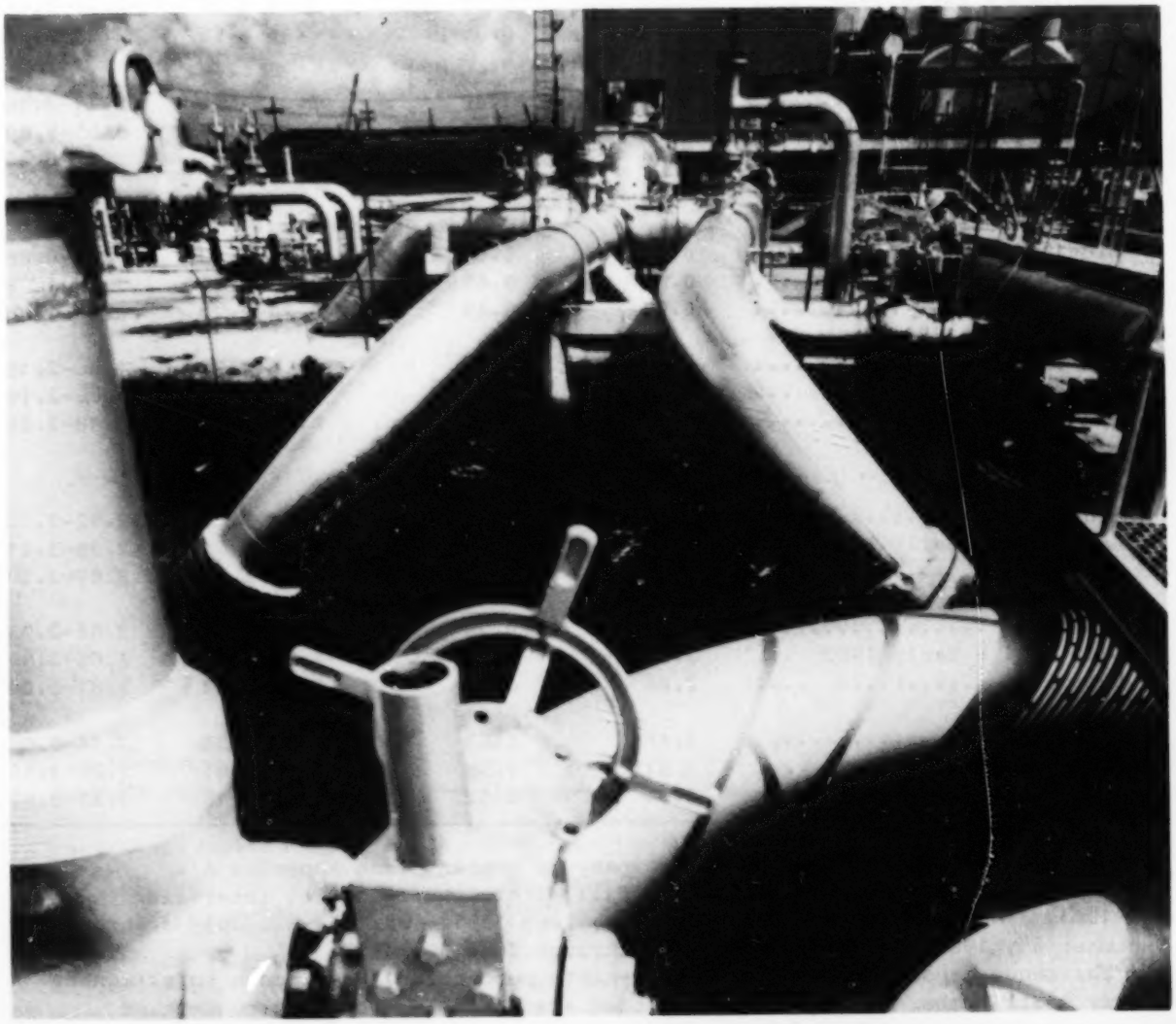


Table 2. Summary Statistics for Natural Gas Wellhead Purchase Prices for Major Interstate Pipeline Contracts, 1981-1982 (Prices in Constant January 1982 Dollars per Thousand Cubic Feet)

Type of Gas and Time Period[a]	Average Price	Standard Deviation	Effective Range[b]	First and Third Quartiles
Old Gas				
Mid-1981	1.24	0.77	0.22-2.68	0.51-2.13
Late 1981 - Early 1982	1.27	0.76	0.21-2.61	0.54-2.12
Mid-1982	1.29	0.80	0.20-2.84	0.52-2.16
New Gas				
Mid-1981	2.96	0.36	2.02-3.82	2.83-3.13
Late 1981 - Early 1982	3.01	0.37	2.07-4.05	2.85-3.18
Mid-1982	3.09	0.36	2.16-4.09	2.91-3.25
High Cost Gas				
Mid-1981	6.12	1.48	2.90-7.59	5.17-7.18
Late 1981 - Early 1982	7.33	1.82	2.94-9.71	6.55-8.80
Mid-1982	7.24	1.73	3.15-9.65	5.87-8.43
Old Gas Subgroups				
Vintage through 1972				
Mid-1981	0.89	0.66	0.22-2.47	0.44-0.88
Late 1981 - Early 1982	0.91	0.65	0.21-2.37	0.45-1.89
Mid-1982	0.91	0.69	0.20-2.75	0.46-1.00
Vintage After 1972				
Mid-1981	1.73	0.64	0.35-2.78	1.06-2.18
Late 1981 - Early 1982	1.72	0.62	0.45-2.79	1.06-2.19
Mid-1982	1.71	0.65	0.45-2.89	1.38-2.20
New Gas Subgroups				
Section 102				
Mid-1981	3.04	0.25	2.33-3.82	2.92-3.15
Late 1981 - Early 1982	3.11	0.24	2.80-3.71	2.98-3.21
Mid-1982	3.20	0.28	2.58-3.88	3.07-3.30
Section 103				
Mid-1981	2.79	0.29	2.01-3.55	2.63-2.93
Late 1981 - Early 1982	2.80	0.31	2.23-3.58	2.64-2.89
Mid-1982	2.86	0.28	2.32-3.66	2.67-3.00
Section 108				
Mid-1981	3.45	0.69	2.17-4.54	3.14-3.60
Late 1981 - Early 1982	3.51	0.58	2.92-4.81	3.20-3.70
Mid-1982	3.64	0.52	2.83-5.16	3.31-3.82

[a]Exact dates covered differ from company to company (see Appendix A). The effective dates of the PGA filings fall within the following intervals: mid-1981, January 1 through June 30, 1981; late 1981 - early 1982, July 1 through December 31, 1981; mid-1982, January 1 through June 30, 1982.

[b]The range reported (first to ninety-ninth percentile) was chosen to eliminate a very small number of extreme values that are probably due to respondent or processing error, and have little effect on most summary statistics.

Purchases and Prices by NGPA Category (continued)

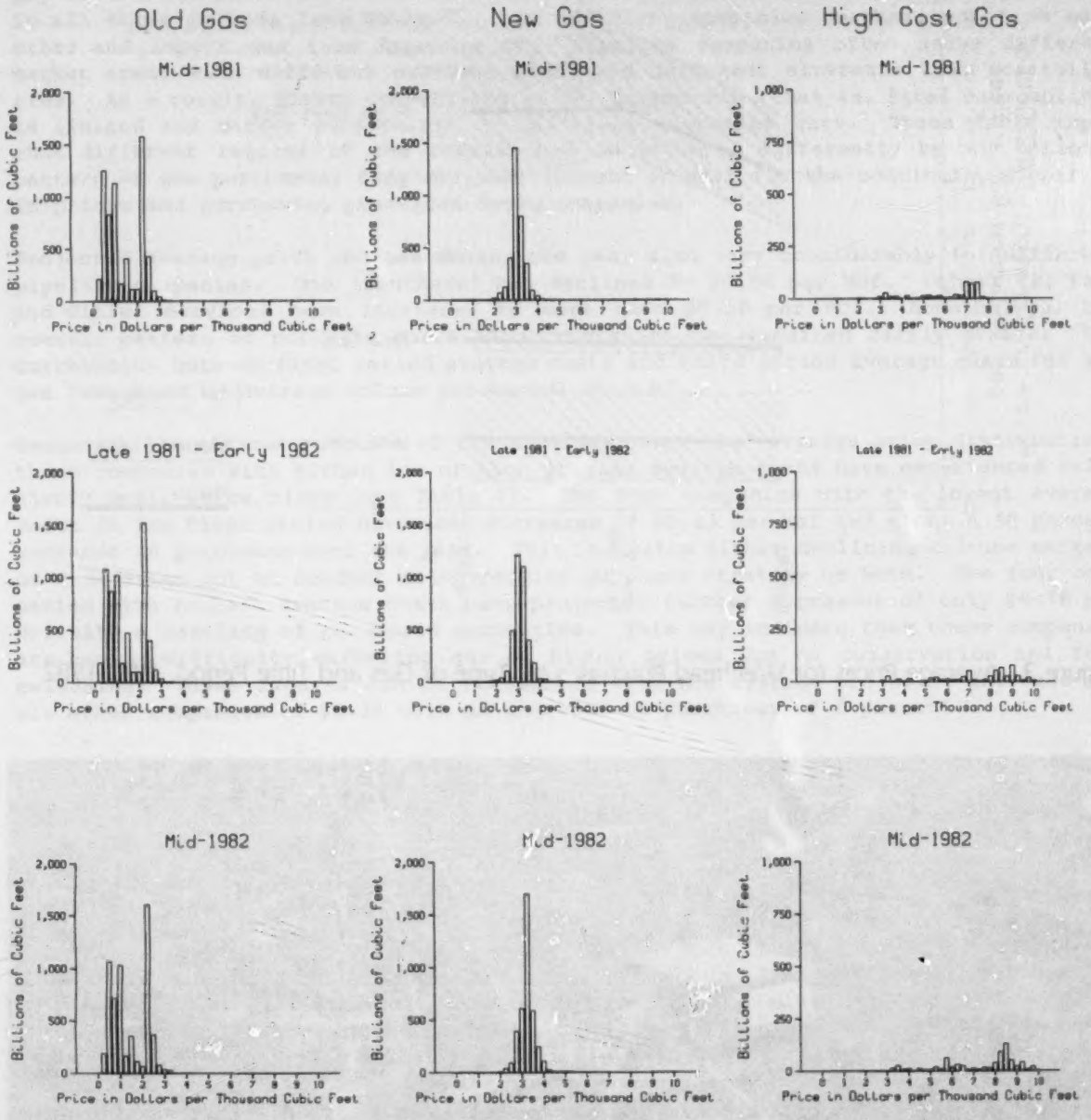


Figure 2. Distribution of Wellhead Purchase Prices for Major Interstate Pipeline Companies by Time Period and Type of Gas, 1981-1982

Purchases and Prices by NGPA Category (continued)

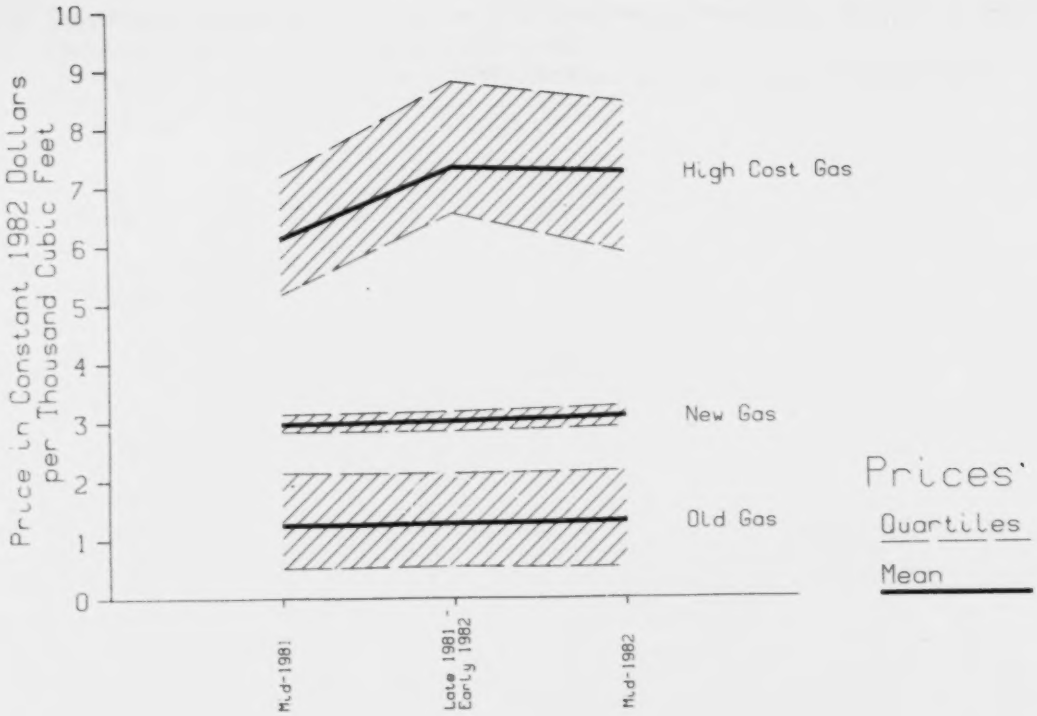


Figure 3. Average Prices for Wellhead Purchases by Type of Gas and Time Period, 1981-1982

3. Purchase Behavior of Pipeline Companies

Prices vary considerably among major pipeline companies. Some pipeline companies pay an average price more than twice as high as others for their wellhead purchases in all three periods (see Table 3). In addition, companies purchase gas from each other and import gas (see Appendix C). Pipeline companies often serve different market areas with different customer mixes and different alternate fuel possibilities. As a result, direct competition at the burner-tip (that is, final consumption) is limited and market constraints on different companies vary. These facts imply that different regions of the country may be affected differently by any national pattern of gas purchases; they may also account in part for the continuing disparity in prices and purchasing practices among companies.

Projected average price changes during the year also vary considerably for different pipeline companies. One (Southern) has declined by $0.06 per Mcf. Others (El Paso and Cities Service) have increased by more than $0.50 per Mcf. Nonetheless, the overall pattern of purchase costs among companies has remained fairly stable. The correlation between first period average costs and third period average costs for all gas (weighted by average volume purchased) is 0.87.

Examining the extreme portions of the pipeline companies' average price distribution, those companies with either low or high initial average costs have experienced relatively small price rises (see Table 4). The four companies with the lowest average costs in the first period have seen increases of $0.23 per Mcf and about a 10 percent decrease in purchases over the year. This indicates either declining end-use markets or a decision not to conduct an aggressive purchase strategy or both. The four companies with highest average costs have projected further increases of only $0.16 per Mcf with a leveling of purchased quantities. This may indicate that these companies are having difficulty marketing gas at higher prices due to conservation and fuel switching. These figures can be contrasted with the average projected increase for all other companies of $0.39 with an increase in purchases of 6 percent.

Eight companies have reduced their wellhead purchases, in one case (Cities Service) by 31 percent. Among the remaining companies, some increases in purchase volumes have been small; others have exceeded 10 percent. One, Northwest, which imports more than half its gas supply from Canada, increased wellhead purchases by 20 percent.

The dispersion in pipeline average acquisition costs does not appear to have diminished during the three time periods. In the first period, 50 percent of all purchases were projected by companies whose average cost differed by $0.52 per Mcf; in the second period, the interquartile range was $0.74 per Mcf, and in the last period, $0.60. There is no strong tendency as yet for average pipeline costs to even out across companies, as there would be if companies with large old gas supplies were using them differentially to bid aggressively for high-cost gas. However, there are indications that companies with very high average prices may already be reaching the limits of their ability to bid very high prices for decontrolled gas.

Differences in average wellhead purchase prices among pipeline companies arise from differences in the proportions of various types of gas that companies purchase, and the average prices that companies pay for each type of gas.

Table 3. Projected Volumes and Prices of Wellhead Purchases for All NGPA Categories, 1981-1982
(Volumes in Billion Cubic Feet; Prices in Constant January 1982 Dollars per Thousand Cubic Feet)

	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
Pipeline Company	Volume[b]	Average Price	Volume[b]	Average Price	Volume[b]	Average Price
Cities Service	344	1.54	303	1.97	236	2.21
Colorado	281	2.36	[c]287	[c]2.48	292	2.60
Columbia	597	2.29	678	2.76	633	2.75
Consolidated	104	2.42	102	2.51	102	2.58
El Paso	1,015	2.00	1,013	2.28	1,132	2.55
Florida	137	1.91	132	1.88	118	1.92
Kansas-Nebraska	76	1.69	[c]70	[c]1.82	63	1.98
Michigan-Wisconsin ...	540	1.93	583	2.20	547	2.29
Natural	848	1.77	863	1.81	900	1.92
Northern	727	1.68	[c]705	[c]1.81	683	1.95
Northwest	135	1.97	156	1.90	162	2.14
Panhandle Eastern	511	1.57	520	1.65	524	1.77
Southern Natural	453	2.59	445	2.73	458	2.53
Tennessee	1,037	1.87	1,075	2.08	1,094	2.43
Texas Eastern	554	1.20	509	1.32	485	1.34
Texas Gas	468	1.95	459	2.20	451	2.27
Transcontinental	849	2.77	844	2.78	879	2.90
Transwestern	269	1.80	268	1.96	297	2.12
Trunkline	591	2.40	578	2.55	589	2.64
United	633	2.18	670	2.40	705	2.56
Total[d]	10,170	2.01	10,260	2.19	10,352	2.35
Range of Pipeline Prices	1.20 - 2.77		1.32 - 2.78		1.34 - 2.90	
Interquartile Range of Pipeline Prices[e] ...	0.52 (1.77 - 2.29)		0.74 (1.81 - 2.55)		0.60 (1.95 - 2.60)	

[a]Exact dates covered differ from company to company (see Appendix A). The effective dates of the PGA filings fall within the following intervals: mid-1981, January 1 through June 30, 1981; late 1981 - early 1982, July 1 through December 31, 1981; mid-1982, January 1 through June 30, 1982.

[b]Volumes are shown at an annual rate.

[c]Volumes and prices are averages of first and third submissions for companies that report annually (and so have no second submission).

[d]Total wellhead gas purchases includes miscellaneous sections not included in any category report (Sections 311 and 312) and slight volumes for which no section was reported or imputed.

[e]Interquartile range refers to the central 50 percent of volumes.

Note: Totals may not sum due to independent rounding.

Table 4. Projected Volumes and Prices for All Wellhead Purchases for Pipeline Companies with Different Initial Average Purchase Prices (Volumes in Billions of Cubic Feet; Prices in Constant January 1982 Dollars per Thousand Cubic Feet)

	Mid-1981		Mid-1982		
	Volume (annual rate)	Average Purchase Price	Volume (annual rate)	Average Purchase Price	Average Price Change, 1981-1982
Four Pipelines with Highest Initial Purchase Costs	1,997	2.60	2,393	2.76	+0.16
Four Pipelines with Lowest Initial Purchase Costs	2,136	1.51	2,027	1.74	+0.23
Other Pipeline Companies	6,037	1.98	5,932	2.37	+0.39

Note: These figures are derived from Table 3 and are subject to the same comments as for Table 1.

Old Gas

Old gas contracts usually allow pipeline companies some flexibility in the volumes they purchase. As a result, companies can sometimes maintain purchases at a relatively high level temporarily, or even increase old gas purchases in the short run. Alternatively, they can occasionally defer purchases to a time when they will be in greater need of cheaper supplies. To the extent that a company depletes its old gas reserves rapidly, low costs during a particular period may be realized at the expense of later rapid increases.

Only three companies (Florida Gas, Northern Natural, and Transcontinental) expected to increase the percentage of their total supply composed of old gas (see Table 5). Only one (Transcontinental) has projected increases in its absolute purchase volumes of old gas (see Table 6). Transcontinental's choice may be part of an effort to limit average acquisition costs in the short run; it had the highest average wellhead purchase cost throughout the time studied. All other companies' projected purchase quantities of old gas have shown decreases, varying in magnitude from company to company. (For reports of old gas by major contract date grouping, see Tables 7 and 8.)

The average purchase costs for old gas have remained extremely stable across pipeline companies. The correlation coefficient between first period costs and third period costs (weighted by average volumes) is 0.97. In part, this high value is achieved because companies maintain roughly similar proportions of earlier and later old gas.

Table 5. Projected Pipeline Purchase Volumes by Type of Gas, 1981-1982 (Volumes in Billion Cubic Feet)

Pipeline Company	Period[a]											
	Mid-1981				Late 1981 - Early 1982				Mid-1982			
	Total Purchase Volumes	Percent of Volumes			Total Purchase Volumes	Percent of Volumes			Total Purchase Volumes	Percent of Volumes		
		Old Gas	New Gas	High Cost		Old Gas	New Gas	High Cost		Old Gas	New Gas	High Cost
Cities Service	344	60	38	2	303	55	40	5	236	50	43	6
Colorado	281	52	36	11	287	49	38	11	292	46	41	12
Columbia	597	46	52	1	678	38	52	9	633	41	48	10
Consolidated	104	33	67	(b)	102	28	72	(b)	102	28	72	(b)
El Paso	1,015	59	37	3	1,013	52	44	4	1,132	47	44	8
Florida	137	64	26	10	132	65	28	6	118	69	23	8
Kansas-Nebraska	76	74	21	5	70	69	26	5	63	63	32	4
Michigan-Wisconsin	540	71	26	3	583	66	27	7	547	67	24	9
Natural	848	78	22	(b)	863	74	25	(b)	900	71	29	(b)
Northern	727	60	39	(b)	705	61	38	1	683	60	38	2
Northwest	135	59	40	(b)	156	53	46	1	162	46	50	4
Panhandle Eastern	511	70	29	1	520	63	36	1	524	61	37	1
Southern	453	55	30	15	445	56	32	12	458	52	39	9
Tennessee	1,037	76	23	(b)	1,075	70	27	2	1,094	61	33	6
Texas Eastern	554	81	19	(b)	509	80	20	1	485	81	18	1
Texas	468	69	25	6	459	70	22	8	451	68	22	10
Transcontinental	849	38	51	11	844	42	47	10	879	41	48	11
Transwestern	269	68	31	1	268	60	36	4	297	42	43	15
Trunkline	591	68	22	10	578	68	23	9	589	65	26	8
United	633	53	44	3	670	51	45	4	705	44	51	5

[a]Exact dates covered differ from company to company (see Appendix A). The effective dates of the PGA filings used fall within the following intervals: mid-1981, January 1 through June 30 1981; late 1981 - early 1982, July 1 through December 31, 1982; mid-1982, January 1 through June 30, 1982.

[b]Percentage of total volume for this type of gas is less than 0.5 percent.

Table 6. Projected Volumes and Prices of Wellhead Purchases of Old Gas (NGPA Sections 104 and 106), 1981-1982
(Volumes in Billion Cubic Feet; Prices in Constant January 1982 Dollars per Thousand Cubic Feet)

	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
Pipeline Company	Volume[b]	Average Price	Volume[b]	Average Price	Volume[b]	Average Price
Cities Service	208	0.62	167	0.67	119	0.68
Colorado	143	1.00	[c]138	[c]0.98	134	0.96
Columbia	274	1.47	257	1.38	262	1.42
Consolidated	34	1.50	29	1.49	28	1.53
El Paso	600	1.17	523	1.28	534	1.20
Florida	88	1.05	86	1.02	82	1.12
Kansas-Nebraska	57	1.03	[c]48	[c]1.06	40	1.11
Michigan-Wisconsin	382	1.39	382	1.36	366	1.30
Natural	661	1.41	642	1.38	636	1.40
Northern	442	0.88	[c]428	[c]1.02	414	1.16
Northwest	82	1.27	83	1.10	74	1.12
Panhandle Eastern	354	0.95	326	0.91	321	0.92
Southern Natural	248	1.17	249	1.21	237	1.18
Tennessee	786	1.53	757	1.50	667	1.54
Texas Eastern	451	0.80	406	0.88	393	0.91
Texas Gas	323	1.20	320	1.21	308	1.22
Transcontinental	323	1.60	355	1.50	363	1.56
Transwestern	156	0.99	143	0.98	127	0.98
Trunkline	403	1.61	391	1.69	385	1.78
United	335	1.40	339	1.45	313	1.44
Total[d,e]	6,348	1.24	6,068	1.27	5,803	1.29
Range of Pipeline Prices	0.62 - 1.61		0.67 - 1.69		0.68 - 1.78	
Interquartile Range of Pipeline Prices[f] ...	0.58 (0.99 - 1.47)		0.47 (1.02 - 1.49)		0.28 (1.16 - 1.44)	

[a]Exact dates covered differ from company to company (see Appendix A). The effective dates of the PGA filings fall within the following intervals: mid-1981, January 1 through June 30, 1981; late 1981 - early 1982, July 1 through December 31, 1981; mid-1982, January 1 through June 30, 1982.

[b]Volumes are shown at an annual rate.

[c]Volumes and prices are averages of first and third submissions for companies that report annually (and so have no second submission).

[d]Total wellhead gas purchases includes miscellaneous sections not included in any category report (Sections 311 and 312) and slight volumes for which no section was reported or imputed.

[e]Totals may not sum due to independent rounding.

[f]Interquartile range refers to the central 50 percent of volumes.

Purchase Behavior of Pipeline Companies (continued)

Table 7. Projected Volumes and Prices of Wellhead Purchases of Old Gas, Contract Vintage 1972 and Before, 1981-1982 (Volumes in Billion Cubic Feet; Prices in Constant January 1982 Dollars per Thousand Cubic Feet)

	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
Pipeline Company	Volume[b]	Average Price	Volume[b]	Average Price	Volume[b]	Average Price
Cities Service	191	0.57	149	0.60	105	0.63
Colorado	109	0.78	[c]107	[c]0.75	105	0.71
Columbia	107	0.85	113	0.79	103	0.75
Consolidated	11	1.06	10	1.07	10	1.02
El Paso	[d]516	[d]1.10	[d]450	[d]1.15	460	1.08
Florida	50	0.47	42	0.45	44	0.43
Kansas-Nebraska	[d]34	[d]0.46	[c,d]29	[c,d]0.48	24	0.50
Michigan-Wisconsin	18	0.48	19	0.47	19	0.47
Natural	289	0.90	280	0.88	270	0.87
Northern	300	0.67	[c]274	[c]0.72	248	0.79
Northwest	35	0.97	41	0.94	37	0.95
Panhandle Eastern	307	0.78	288	0.76	265	0.75
Southern Natural	109	0.78	93	0.80	106	0.70
Tennessee	505	1.23	504	1.24	406	1.18
Texas Eastern	337	0.45	288	0.47	295	0.61
Texas Gas	109	0.89	95	0.85	100	0.91
Transcontinental	141	1.15	188	1.12	165	1.17
Transwestern	79	0.73	63	0.72	51	0.66
Trunkline	164	1.13	155	1.23	151	1.37
United	124	0.99	98	1.04	88	0.97
Total[e]	3,535	0.89	3,286	0.91	3,054	0.91
Range of Pipeline Prices	0.46 - 1.23		0.45 - 1.24		0.43 - 1.37	
Interquartile Range of Pipeline Prices[f]	0.32 (0.78 - 1.10)		0.43 (0.72 - 1.15)		0.33 (0.75 - 1.08)	

[a]Exact dates covered differ from company to company (see Appendix A). The effective dates of the PGA filings fall within the following intervals: mid-1981, January 1 through June 30, 1981; late 1981 - early 1982, July 1 through December 31, 1981; mid-1982, January 1 through June 30, 1982.

[b]Volumes are shown at an annual rate.

[c]Volumes and prices are averages of first and third submissions for companies that report annually (and so have no second submission).

[d]Prices and volumes imputed in order to allow comparison of totals because contract vintage not available or undetermined.

[e]Totals may not sum due to independent rounding.

[f]Interquartile range refers to the central 50 percent of volumes.

Table 8. Projected Volumes and Prices of Wellhead Purchases of Old Gas, Contract Vintage 1973 and After, 1981-1982 (Volumes in Billion Cubic Feet; Prices in Constant January 1982 Dollars per Thousand Cubic Feet)

	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
Pipeline Company	Volume[b]	Average Price	Volume[b]	Average Price	Volume[b]	Average Price
Cities Service	16	1.27	15	1.28	11	1.17
Colorado	34	1.71	[c]28	[c]1.76	23	1.84
Columbia	164	1.86	143	1.85	155	1.86
Consolidated	8	1.74	6	1.71	5	1.78
El Paso	[d]82	[d]1.98	[d]71	[d]2.06	73	1.94
Florida	38	1.79	40	1.69	37	1.91
Kansas-Nebraska	[d]22	[d]1.86	[c,d]17	[c,d]1.83	13	2.00
Michigan-Wisconsin	279	1.48	[d]279	[c]1.45	[d]267	[d]1.39
Natural	342	1.91	330	1.86	335	1.89
Northern	57	1.26	[c]77	[c]1.62	96	1.83
Northwest	42	1.37	41	1.23	36	1.26
Panhandle Eastern	47	1.88	38	1.85	56	1.75
Southern Natural	138	1.49	144	1.54	131	1.56
Tennessee	281	2.06	253	2.02	261	2.11
Texas Eastern	114	1.83	118	1.88	97	1.84
Texas Gas	214	1.36	225	1.36	208	1.38
Transcontinental	182	1.95	167	1.92	198	1.90
Transwestern	77	1.26	80	1.18	76	1.20
Trunkline	239	1.94	236	1.99	234	2.04
United	211	1.64	240	1.62	225	1.63
Total[e]	2,587	1.73	2,548	1.72	2,610	1.71
Range of Pipeline Prices	1.26 - 2.06		1.18 - 2.06		1.17 - 2.11	
Interquartile Range of Pipeline Prices[f]	0.45 (1.49 - 1.94)		0.47 (1.45 - 1.92)		0.34 (1.56 - 1.90)	

[a]Exact dates covered differ from company to company (see Appendix A). The effective dates of the PGA filings fall within the following intervals: mid-1981, January 1 through June 30, 1981; late 1981 - early 1982, July 1 through December 31, 1981; mid-1982, January 1 through June 30, 1982.

[b]Volumes are shown at an annual rate.

[c]Volumes and prices are averages of first and third submissions for companies that report annually (and so have no second submission).

[d]Prices and volumes imputed in order to allow comparison of totals because contract vintage not available or undetermined.

[e]Totals may not sum due to independent rounding.

[f]Interquartile range refers to the central 50 percent of volumes.

Table 9. Relationship between Purchases of Old Gas and Gas Subject to NGPA Sections 103 and 108

Dependent Variable	Projected purchase volumes of old gas, mid-1982
Predictor Variables	Projected purchase volumes of old gas, mid-1981 Regression coefficient = 0.903 Standard error = 0.016
	Difference in purchase volumes of Section 108 gas between mid-1982 and mid-1981 Regression coefficient = 2.49 Standard error = 0.971
	Difference in purchase volumes of Section 103 gas between mid-1982 and mid-1981 Regression coefficient = 0.438 Standard error = 0.340
Explained Variation	0.99
Degrees of Freedom	17

Even within major date groupings, however, the correlations of weighted first and third period prices are very high -- 0.94 for earlier vintages and 0.97 for later.

Old Gas Supplies and Development Under NGPA Section 103

It has been hypothesized that some natural gas producers have been able to produce old gas volumes as new gas by drilling new development wells in old fields, or by reclassifying old wells as stripper wells -- sometimes referred to as "category creep." It is not possible to test this hypothesis directly with data from pipelines. However, if this process were widespread, one could expect to see the practice reflected in the PGA submissions filed by pipelines. In particular, one might expect to see the following:

- Purchases of old gas in mid-1982 should be lower than that due to normal depletion from mid-1981 levels.
- Declines in old gas purchases beyond expected levels should be correlated with increased purchases of gas subject to Sections 103 and 108.

The correlation between the change in old gas and Section 103 gas purchases is almost zero. Table 9 shows the results of an effort to predict mid-1982 old gas purchases by using mid-1981 old gas purchases and the change in purchases under Section 103 between mid-1981 and mid-1982. As expected, the pattern of old gas purchases is highly stable indicating a 10 percent decline or a reserves-to-production ratio of 10. However, increased purchases of Section 103 gas show no definitive relationship to mid-1982 old gas purchases. To the extent that any effect can be estimated in this manner, increased purchases of Section 103 gas and Section 108 gas are associated with smaller decreases than expected in old gas purchases. This result provides no evidence that there has been any substantial degree of gas reclassification.

New Gas

Pipeline companies generally have relatively little latitude to change their purchases from existing new gas contracts. They can manage the rate at which they enter new contracts, however. One would expect most companies to have increased their new gas purchases (or decreased them only slightly), but to have increased them at a rate that varied from company to company depending on consumer demand.

Eight of the 20 companies have projected decreases in their purchases of new gas (see Tables 10-13). In two cases (Cities Service and Florida Gas), the decrease has been greater than 20 percent, and in two others (Texas Eastern and Texas Gas), the decrease has been between 10 and 20 percent. Among companies with increases, there is (as expected) wide variation in the size of the increases.

The pattern of volume changes is approximately the same for both major constituents of new gas (NGPA Sections 102 and 103), but the pipeline companies differ greatly in their relative endowments of these two types of gas. One company (Northwest) currently purchases four times as much gas under Section 103 as under Section 102. Another company (Trunkline) purchases more than 90 percent of its new gas under Section 102. This may be due, in large part, to the nature of their supply areas.

Average purchase costs for new gas in general and for individual NGPA Sections in particular are tightly grouped. The interquartile range for all new gas purchases indicates that 50 percent of all projected purchases have been made by companies with average purchase costs that varied by only $0.08 per Mcf in the first time period, $0.07 per Mcf in the second, and $0.09 per Mcf in the third (see Table 10). The stability of this dispersion arises despite the facts that the corresponding ranges for Sections 102 and 103 individually have been somewhat greater, and that the prices of the two types have diverged.

Purchase Volumes of NGPA Section 102 Gas

All interstate pipeline companies have purchased fairly substantial supplies of new gas. The primary motivations behind such purchases are to insure deliverability and to replenish reserves. Even those companies that currently have surpluses of gas available face a more difficult long-term situation because reserves are relatively low. The purpose of this section is to examine the degree to which some companies have projected relatively larger purchases than others, and the correlates of such behavior. The results should not be interpreted as an explanation of the practice of purchasing new gas (which all companies must do) but only as an interpretation of differences in the extent of such purchases. Similarly, the data currently available are limited, so that the correlates of relatively large purchases, noted below, should not be considered an exhaustive list.

Most new gas supplies are covered by Sections 102 and 103. Most of the gas covered by Section 103 represents development of existing fields and reservoirs. As a result, purchases of gas covered by Section 102 are probably the best indication of a company's overall efforts to acquire new gas supplies. There was no correlation between the quantity purchased and the price paid for Section 102 gas.

The data available for this study indicate that three variables are related to purchase volumes of gas subject to Section 102 for some or all PGA filings: the average price of old gas purchases, the difference in reserves between 1977 and 1980, and curtailments experienced during the winter of 1976-1977. Table 14 shows the regression coefficients and their standard errors for these results.

Table 10. Projected Volumes and Prices of Wellhead Purchases of New Gas (NGPA Sections 102, 103, 108, and 109), 1981-1982
(Volumes in Billion Cubic Feet; Prices in Constant January 1982 Dollars per Thousand Cubic Feet)

	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
Pipeline Company	Volume[b]	Average Price	Volume[b]	Average Price	Volume[b]	Average Price
Cities Service	129	2.99	121	3.34	102	3.44
Colorado	100	3.05	[c]110	[c]3.07	119	3.09
Columbia	310	2.97	351	2.91	303	2.95
Consolidated	70	2.89	73	2.93	74	3.00
El Paso	380	3.08	443	3.07	495	3.20
Florida	36	2.93	37	2.97	27	3.10
Kansas-Nebraska	16	2.96	[c]18	[c]3.05	20	3.11
Michigan-Wisconsin	141	3.00	158	2.97	131	3.11
Natural	187	3.04	219	3.04	261	3.15
Northern	282	2.90	[c]269	[c]2.98	256	3.07
Northwest	53	3.02	71	2.76	82	2.82
Panhandle Eastern	150	2.94	187	2.87	193	2.99
Southern Natural	137	2.93	141	3.02	179	3.03
Tennessee	236	2.97	294	3.06	336	3.15
Texas Eastern	103	2.93	100	3.00	89	3.06
Texas Gas	118	2.84	103	2.93	99	3.00
Transcontinental	431	2.92	401	3.00	422	3.07
Transwestern	83	2.95	97	2.94	124	3.08
Trunkline	130	2.88	136	3.00	155	3.10
United	253	2.93	278	3.03	326	3.13
Total[d]	3,347	2.96	3,610	3.01	3,825	3.09
Range of Pipeline Prices	2.84 - 3.08		2.76 - 3.34		2.82 - 3.44	
Interquartile Range of Pipeline Prices[e]	0.08 (2.92 - 3.00)		0.07 (2.97 - 3.04)		0.09 (3.06 - 3.15)	

[a]Exact dates covered differ from company to company (see Appendix A). The effective dates of the PGA filings fall within the following intervals: mid-1981, January 1 through June 30, 1981; late 1981 - early 1982, July 1 through December 31, 1981; mid-1982, January 1 through June 30, 1982.

[b]Volumes are shown at an annual rate.

[c]Volumes and prices are averages of first and third submissions for companies that report annually (and so have no second submission).

[d]Totals may not sum due to independent rounding.

[e]Interquartile range refers to the central 50 percent of volumes.

Table 11. Projected Volumes and Prices of Wellhead Purchases of NGPA Section 102 New Gas, 1981-1982
(Volumes in Billion Cubic Feet; Prices in Constant January 1982 Dollars per Thousand Cubic Feet)

	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
Pipeline Company	Volume[b]	Average Price	Volume[b]	Average Price	Volume[b]	Average Price
Cities Service	22	2.94	26	3.03	32	3.07
Colorado	45	3.30	[c]52	[c]3.35	60	3.39
Columbia	230	3.02	248	3.01	195	3.09
Consolidated	19	2.93	21	2.99	19	3.08
El Paso	91	3.35	131	3.46	177	3.45
Florida	26	3.07	27	3.11	19	3.28
Kansas-Nebraska	5	3.24	[c]6	[c]3.37	7	3.47
Michigan-Wisconsin	94	3.04	112	3.04	87	3.19
Natural	125	3.16	143	3.19	177	3.30
Northern	137	3.10	[c]123	[c]3.13	110	3.16
Northwest	6	2.98	11	3.07	14	3.17
Panhandle Eastern	37	2.96	44	2.92	42	3.34
Southern Natural	103	3.04	111	3.11	129	3.17
Tennessee	159	3.06	219	3.14	296	3.21
Texas Eastern	77	3.01	74	3.10	64	3.17
Texas Gas	75	2.96	70	3.05	67	3.14
Transcontinental	404	2.95	373	3.03	395	3.09
Transwestern	33	3.20	41	3.21	59	3.33
Trunkline	121	2.91	126	3.02	146	3.12
United	182	3.02	202	3.14	246	3.23
Total[d]	1,992	3.04	2,161	3.11	2,342	3.20
Range of Pipeline Prices	2.80 - 3.35		2.93 - 3.46		3.00 - 3.54	
Interquartile Range of Pipeline Prices[e]	0.11 (2.95 - 3.06)		0.11 (3.03 - 3.14)		0.14 (3.09 - 3.23)	

[a]Exact dates covered differ from company to company (see Appendix A). The effective dates of the PGA filings fall within the following intervals: mid-1981, January 1 through June 30, 1981; late 1981 - early 1982, July 1 through December 31, 1981; mid-1982, January 1 through June 30, 1982.

[b]Volumes are shown at an annual rate.

[c]Volumes and prices are averages of first and third submissions for companies that report annually (and so have no second submission).

[d]Totals may not sum due to independent rounding.

[e]Interquartile range refers to the central 50 percent of volumes.

Table 12. Projected Volumes and Prices of Wellhead Purchases of NGPA Section 103 New Gas, 1981-1982 (Volumes in Billion Cubic Feet; Prices in Constant January 1982 Dollars per Thousand Cubic Feet)

	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
Pipeline Company	Volume[b]	Average Price	Volume[b]	Average Price	Volume[b]	Average Price
Cities Service	39	2.53	35	2.69	24	2.59
Colorado	49	2.85	[c]48	[c]2.84	47	2.83
Columbia	71	2.77	91	2.59	96	2.63
Consolidated	22	2.56	22	2.57	25	2.61
El Paso	220	2.97	231	2.99	254	3.08
Florida	4	2.82	6	2.75	5	2.81
Kansas-Nebraska	8	2.72	[c]9	[c]2.77	10	2.81
Michigan-Wisconsin	46	2.93	41	2.87	40	2.94
Natural	52	2.79	66	2.78	75	2.87
Northern	119	2.51	[c]113	[c]2.66	107	2.83
Northwest	40	2.98	52	2.69	57	2.73
Panhandle Eastern	100	2.94	124	2.87	139	2.88
Southern Natural	29	2.67	27	2.69	30	2.71
Tennessee	65	2.77	60	2.80	62	2.86
Texas Eastern	25	2.72	24	2.76	23	2.78
Texas Gas	40	2.63	31	2.67	30	2.67
Transcontinental	11	2.74	16	2.76	18	2.77
Transwestern	48	2.79	51	2.75	60	2.86
Trunkline	5	2.75	9	2.72	8	2.80
United	67	2.69	71	2.75	74	2.81
Total[d]	1,060	2.79	1,128	2.80	1,184	2.86
Range of Pipeline Prices	2.51 - 2.98		2.59 - 2.99		2.59 - 3.08	
Interquartile Range of Pipeline Prices[e]	0.25 (2.69 - 2.94)		0.18 (2.69 - 2.87)		0.10 (2.78 - 2.88)	

[a]Exact dates covered differ from company to company (see Appendix A). The effective dates of the PGA filings fall within the following intervals: mid-1981, January 1 through June 30, 1981; late 1981 - early 1982, July 1 through December 31, 1981; mid-1982, January 1 through June 30, 1982.

[b]Volumes are shown at an annual rate.

[c]Volumes and prices are averages of first and third submissions for companies that report annually (and so have no second submission).

[d]Totals may not sum due to independent rounding.

[e]Interquartile range refers to the central 50 percent of volumes.

Table 13. Projected Volumes and Prices of Wellhead Purchases of NGPA Section 108 New Gas (Stripper Wells), 1981-1982
(Volumes in Billion Cubic Feet; Prices in Constant January 1982 Dollars per Thousand Cubic Feet)

	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
Pipeline Company	Volume[b]	Average Price	Volume[b]	Average Price	Volume[b]	Average Price
Cities Service	64	3.27	61	3.85	47	4.13
Colorado	2	3.43	[c]3	[c]3.35	3	3.24
Columbia	7	3.54	11	3.25	11	3.35
Consolidated	28	3.13	29	3.20	29	3.31
El Paso	30	3.97	26	3.47	20	3.98
Florida	([d])	3.50	([d])	3.48	([d])	3.61
Kansas-Nebraska	2	3.21	[c]2	[c]3.32	3	3.42
Michigan-Wisconsin	1	3.51	3	2.23	1	3.65
Natural	4	3.47	4	3.49	5	3.57
Northern	27	3.59	[c]33	[c]3.52	40	3.47
Northwest	4	3.83	5	3.35	5	3.46
Panhandle Eastern	4	3.67	6	3.58	6	3.67
Southern Natural	([d])	3.14	2	3.16	8	3.18
Tennessee	4	4.13	6	3.94	5	3.85
Texas Eastern	([d])	3.32	([d])	3.40	1	3.50
Texas Gas	1	3.09	2	3.12	2	3.24
Transcontinental	1	3.22	1	3.43	1	3.39
Transwestern	1	3.43	2	2.75	2	3.15
Trunkline	([d])	2.54	([d])	3.49	([d])	3.60
United	3	2.56	5	2.92	6	3.14
Total[e]	185	3.45	199	3.51	194	3.64
Range of Pipeline Prices	2.54 - 4.13		2.23 - 3.94		3.14 - 4.13	

[a]Exact dates covered differ from company to company (see Appendix A). The effective dates of the PGA filings fall within the following intervals: mid-1981, January 1 through June 30, 1981; late 1981 - early 1982, July 1 through December 31, 1981; mid-1982, January 1 through June 30, 1982.

[b]Volumes are shown at an annual rate.

[c]Volumes and prices are averages of first and third submissions for companies that report annually (and so have no second submission).

[d]Less than 0.5 Bcf volume.

[e]Totals may not sum due to independent rounding.

Table 14. Correlates of Purchased Gas Volumes under NGPA Section 102

Variable (Units)	Mid-1981		Late 1981 - Early 1982		Mid-1982	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Curtailments, 1976-1977	0.59	0.17	0.58	0.16	0.66	0.16
Average Price for Old Gas ($/MMcf)	160	54	168	55	178	53
Change in Reserve Volumes, 1977-1980 (Bcf)	-0.027	0.021	-0.025	0.020	-0.016	0.019
Intercept	-160		-162		-181	
Explained Variation (R-squared) ...	0.61		0.66		0.72	
Degrees of Freedom	16		16		16	

For all three PGA filings, there is a strong relationship between purchase of gas under Section 102 and the price of a company's old gas supplies. One explanation for this result is as follows: any company that attempted to buy new gas supplies in the 1970s would obtain contracts with producers on a substantial amount of new land. The part of this land that was developed early would qualify as old gas with relatively higher prices; the part that was developed later would largely qualify for treatment under Section 102, with the result that Section 102 volumes and old gas prices would be positively related.

The evidence available suggests that companies which experienced greater curtailments during the mid-1970s and decreases during the late 1970s (1977-1980) are currently purchasing greater quantities of new gas under Section 102. This may indicate a reaction to direct experience of the supply shortage of those years; but it is more likely that companies with major supply shortages during the 1970s are also those that have been most in need of new supplies after the NGPA.

High-Cost Gas Purchases

High-cost gas represents the most heterogeneous natural gas price grouping for pipeline companies (see Table 15). No straightforward generalizations about changes in either volumes or prices apply to all or most companies.

In terms of purchased volumes, three broad patterns can be distinguished among pipeline companies:

- Those that have never entered the high-cost gas market in a major way. For present purposes, these companies are taken to be those that have never projected purchases at a rate of 10 Bcf per year or more. These companies include one that has reported no high-cost gas purchases (Consolidated) and five others.
- Those that have increased purchases by more than 50 percent over the past year. Nine companies fit this description. In three cases (Cities Service, Columbia, and Michigan-Wisconsin), however, the growth of projected purchase volumes appears to have slowed or stopped between the second and third filings.
- Those whose projected purchases of high-cost gas have declined over the past year, or increased by less than 15 percent. Five companies are included, only one of which (Colorado) recorded an increase. One company (Southern) projected purchases decreasing by 39 percent.

The ability to decrease projected purchases of high-cost gas may be due to a number of factors: high-cost gas contracts often contain relatively liberal take-or-pay provisions compared to other new gas supplies [see reference 9]; some projected purchases may not take place; pipeline companies may invoke market-out clauses if this option is available, or seek relief in some other way, though there is no evidence that such relief is reflected in the data presented here.

Projected price changes show two major patterns:

- Continuing increase throughout the year, and
- A maximum average price occurring sometime before the final period, most typically in the second period.

A few companies are impossible to categorize in this way. There is no way to know if Colorado's current average cost represents a decline from the second period for which there is no filing, and the same is true for Northern. Transwestern recorded a price peak in the first period on very small volumes.

There are two interesting features of the high-cost gas market. First, the higher end of the market (in terms of price) has softened considerably in the past 6 months. The five companies with the highest prices in the second period all reported declining prices for the third. These declines were substantial for the top three companies, and occurred despite the fact that two of them increased their purchased volumes between the two periods.

Second, of the five companies with the highest average prices for all gas in the first period (Transcontinental, Southern, Consolidated, Trunkline, and Colorado), one (Consolidated) remains alone in not entering the market for high-cost gas on even a small

Table 15. Projected Volumes and Prices of Wellhead Purchases of High-Cost Gas (NGPA Section 107), 1981-1982
(Volumes in Billion Cubic Feet; Prices in Constant January 1982 Dollars per Thousand Cubic Feet)

Pipeline Company	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
	Volume[b]	Average Price	Volume[b]	Average Price	Volume[b]	Average Price
Cities Service	7	3.34	15	5.43	15	6.01
Colorado	31	6.35	[c]33	[c]6.88	35	7.34
Columbia	4	6.84	62	7.81	61	7.63
Consolidated	([d])	([d])	([d])	([d])	([d])	([d])
El Paso	35	4.54	44	6.12	91	6.90
Florida	14	4.79	8	5.84	9	5.82
Kansas-Nebraska	4	6.68	[c]3	[c]6.47	3	6.21
Michigan-Wisconsin	17	5.14	41	7.04	48	7.57
Natural	([e])	4.79	2	3.78	4	4.76
Northern	3	4.37	[c]8	[c]5.00	13	5.15
Northwest	([d])	([d])	2	5.19	6	5.35
Panhandle Eastern	4	5.14	4	6.42	7	7.40
Southern Natural	69	7.02	56	8.80	42	8.09
Tennessee	5	4.91	24	8.43	61	7.86
Texas Eastern	([e])	4.71	3	4.50	3	5.87
Texas Gas	26	7.23	36	8.93	44	7.98
Transcontinental	95	6.07	88	6.94	94	7.35
Transwestern	3	6.10	10	5.48	46	5.98
Trunkline	58	6.78	51	7.94	49	7.93
United	17	5.39	28	6.95	34	6.72
Total[f]	390	6.12	517	7.33	664	7.24
Range of Pipeline Prices	3.34 - 7.23		3.78 - 8.93		4.76 - 8.09	
Interquartile Range of Pipeline Prices[g]	1.45 (5.39 - 6.84)		1.06 (6.88 - 7.94)		0.96 (6.90 - 7.86)	

[a]Exact dates covered differ from company to company (see Appendix A). The effective dates of the PGA filings fall within the following intervals: mid-1981, January 1 through June 30, 1981; late 1981 - early 1982, July 1 through December 31, 1981; mid-1982, January 1 through June 30, 1982.

[b]Volumes are shown at an annual rate.

[c]Volumes and prices are averages of first and third submissions for companies that report annually (and so have no second submission).

[d]No NGPA Section 107 gas reported.

[e]Less than 0.5 Bcf volume.

[f]Totals may not sum due to independent rounding.

[g]Interquartile range refers to the central 50 percent of volumes.

scale, and the others all belong to the group of companies with declining or slowly growing purchases. The only major regularity between volume and price changes during 1981 and 1982 for high-cost gas is that companies with small purchases throughout have continued to experience increases in price (see Table 16).

The most likely explanation for the first result is that market forces have put an effective cap on average high-cost gas prices. The second result suggests that pipeline companies are using changes in high-cost gas volumes to modify their overall price structures, even when they cannot limit the average cost of high-cost supplies. It is quite likely that this behavior is a reflection of market forces at the consumer level.

Table 16. Changes in High-Cost Gas Volumes and Prices, 1981-1982

Volumetric Changes	Price Changes		
	Continued Increases	Early Price Peaking	Other
Companies with Consistently Small Purchases (Less Than 10 Bcf per Year)	Natural Northwest Panhandle East Texas Eastern	Kansas-Nebraska	Consolidated
Companies with Purchase Increases of More Than 50 Percent	Cities Service El Paso Michigan-Wisconsin	Columbia Tennessee Texas Gas United	Northern Transwestern
Companies with Purchase Decreases or Increases of Less Than 15 Percent	Transcontinental	Florida Southern Trunkline	Colorado

High-Cost Gas Volumes

High-cost purchases are important for the light they shed on the current nature of the natural gas market at the wellhead. Several mechanisms have been proposed to explain the differences in purchase behavior among companies. Among these are:

- Companies with a large supply of inexpensive older gas will buy large volumes of high-cost gas by bidding the price to a level other companies cannot afford to match.
- Companies that wish to build up their reserves will buy high-cost gas as part of an overall strategy of new acquisition.
- Companies with relatively severe experience of curtailments will purchase new supplies even at very high costs.

Analysis of the data available for this report indicates that four variables are related to purchase volumes of high-cost gas (Section 107) for some or all PGA filings: the price paid for the gas, the volume of old gas purchased (negative), the volume of new gas purchased under NGPA Section 102, and the difference in the company's reserves between 1977 and 1980. Table 17 shows the regression coefficients and their standard errors for these results.

In a purely competitive market with perfect foresight, the price paid for gas would not be related to the quantity purchased. Because the wellhead gas market depends on future expectations, which are difficult to assess, and several other factors, this is not the case. The volume of high-cost gas that a company acquires depends on the price it is willing to pay. The willingness to pay higher prices allows a company to buy more.

Purchase volumes of old and high-cost gas are negatively associated to a fairly high degree for the mid-1981 and late 1981 - early 1982 PGA filings. Companies with substantial supplies of old gas appear not to have engaged in aggressive acquisition programs for high-cost gas.

Those companies that have increased their reserves inventories from 1977 through 1980 are associated with higher purchases of high-cost gas. Additionally, the purchasers of large quantities of Section 102 gas are associated with high purchases of high-cost gas. These two relationships appear to indicate that the purchase of high-cost gas may be part of an aggressive acquisition program to increase reserves by purchases of Section 102 and high-cost gas.

In any case, the present data do not indicate that companies with large supplies of old gas are currently using them differentially to purchase decontrolled gas aggressively. Such companies may have a disincentive to bid aggressively for high-cost gas. Such a purchase strategy would be highly speculative. A company with no supply shortage can sell its increased supplies only by increasing its markets. This requires a decision that balances a number of factors in addition to the availability of gas supplies. Finally, in the absence of market-out contract provisions, the company would commit itself to buy expensive supplies of gas for many years in the future, even after old supplies have disappeared.

This finding does not imply that companies have failed to use any existing "cushion" of old gas to bid up decontrolled gas prices. The price of decontrolled gas has been and is now well above a price that could be sustained if all gas prices were

Table 17. Correlates of High-Cost Gas Purchase Volumes

Variable (Units)	Mid-1981 Regression Coefficient	Mid-1981 Standard Error	Late 1981 - Early 1982 Regression Coefficient	Late 1981 - Early 1982 Standard Error	Mid-1982 Regression Coefficient	Mid-1982 Standard Error
Average Price of High-Cost Gas ($/MMcf)	4.69	2.38	5.50	1.43	6.48	2.15
Volume of Old Gas Purchases (Bcf)	-0.035	0.023	-0.043	0.017	-0.022	0.025
Volume of Section 102 Gas Purchases (Bcf)	0.131	0.055	0.187	0.037	0.148	0.049
Change in Reserve Volumes, 1977-1980 (Bcf)	0.012	0.0042	0.0071	0.0033	0.0132	0.0046
Intercept	-8.51		-16.74		-22.06	
Explained Variation (R-squared) ...	0.59		0.83		0.77	
Degrees of Freedom	15		15		15	

decontrolled. This has occurred because most interstate pipeline companies have had a "cushion" of controlled gas, and those who have chosen to purchase high-cost gas have been able to bid high prices. But the companies purchasing relatively large quantities of high-cost gas are not as yet those with large amounts of old gas.

A mitigating factor in the analysis of gas "cushions" is that in theory burner tip prices and quantities, which include all gas purchases, must be measured. In addition the individual demand elasticities of each company's market are needed. The analysis here examines only the wellhead purchases.

Purchase Behavior of Pipeline Companies (continued)

In later years -- in particular, 1985 -- more supplies will be decontrolled. According to this analysis, many of the companies with the largest supplies of controlled gas may have purchased only small quantities of high-cost gas by that time, while other companies may well have depleted their original "cushions" substantially. Companies with large cushions may be in an advantageous bidding position, and it is quite possible that competition for large supplies of newly decontrolled gas may then occur on quite unequal terms within the interstate market.

4. Public Positions of Pipeline Companies

Pipeline companies have been in different market positions during the past few years. It is not surprising that their public positions about current and future issues should differ.

Each pipeline company's annual corporate report was reviewed for comments about major policy and pricing issues (see Appendix A). Positions expressed in annual reports represent only a part of corporate policy -- generally, those aspects that the company considers particularly important or deserving of a wide audience. A company is not bound by its annual report, but the positions taken there are important as expressions of policy that cannot be altered publicly without embarrassment.

Deregulation

Of the 20 pipeline companies surveyed, 12 used their annual reports to express an opinion on price deregulation. Ten of these favor gradual deregulation while two oppose deregulation, especially of old gas.

Companies who favor deregulation do so with some reservation. Many express concern about the possibility that prices might rise rapidly at the time of deregulation (the "fly-up") or that indefinite price escalator clauses in producer contracts might lead to a competitive disadvantage with alternate fuels. Nonetheless, these companies feel that deregulation is needed in the gas market. They favor a gradual deregulation that would contain provisions to mitigate the more severe short-run price changes.

One company (Northwest) favors deregulation but expects to see little effect from such a policy. Northwest already imports a substantial part of its supply from Canada. The company believes that its average prices are already high enough so that additional increases from deregulation will have little effect on its customer base.

The two companies that oppose deregulation (Columbia and Consolidated) serve the mid-Atlantic and New England markets. They oppose any form of decontrol that includes old gas or that does not specifically minimize the effect of indefinite price escalator clauses in producer contracts. The position taken by Columbia and Consolidated may reflect their current market situations. Each appears particularly vulnerable to cost increases, most of all to those associated with decontrol of old gas prices. Both have high average acquisition costs and a substantial base of old gas. Further, both purchase large portions of their gas supply from other pipelines and have little or no control over the pricing of these purchases. They have also experienced increasing opposition to higher costs from consumers and utility commissions.

Take-or-Pay Provisions

Most producer contracts contain provisions requiring pipeline companies to buy at least a specified amount of gas each year. Even if a company cannot sell the full amount, it must still pay for it. (It may take supplies it has paid for at a later date, however.) Take-or-pay provisions became more constraining and harder to manage when they were based on deliverability rather than a constant portion of reserves. Take-or-pay provisions become a concern for pipeline companies in a period of declin-

ing demand such as that now facing a number of companies. A few pipeline company annual reports (for instance, Panhandle Eastern and Northern) indicate that they intend to contest such provisions or to refuse to pay for any gas not received.

At the same time, several pipeline companies are increasing minimum bill provisions of their sales contracts to distributors. (Such provisions are analogous to take-or-pay clauses except that distributors may not delay receipt of gas.) The pipeline companies are concerned that some distributors switch from one supplier to another to find the lowest price. Some distributors are also delaying or protesting payment under minimum bill clauses.

Cost-of-Service Gas

For the first few years of the NGPA, a company's own production of gas from pre-October 1969 leases and pre-1973 wells was subject to cost-of-service pricing, not to NGPA prices. The price of such supplies remained at a very low level. A recent court decision [Mid-Louisiana et al. vs. FERC, 5th Circuit, Nos. 80-3804 and 80-4010, 664 F. 2d 530 (1981)] allowed cost-of-service gas to be priced according to NGPA categories. This decision is subject to possible judicial review. Nonetheless, three companies (Colorado, Columbia, and Consolidated) with substantial reserves of company-owned gas mention the decision and its results in their annual reports. They anticipate a favorable effect on future earnings.

Curtailments

Pipeline companies express no great concern over short-term supply shortages in their annual reports. Indeed, some report that they currently have a supply surplus (Natural and Colorado).

The lack of apparent concern about short-term supply shortages coincides with a lack of need to curtail customers. According to FERC Form 16 filings [14], the current level of curtailments is the lowest since the early 1970s. Only four companies report any curtailments, and in three cases the shortages are purely nominal. In only one case (El Paso) have customer deliveries been curtailed, but this is the result of pipeline capacity limitations, not lack of supply.

The presence of adequate supplies in the short run should not be interpreted as an indication of long-term sufficiency. Almost all companies have low reserves to production ratios in historical terms. The current situation may result largely from the stringent take-or-pay provisions of new gas contracts, which simultaneously increase current production and lower reserves.

Companies attribute their current lack of shortages to three major causes:

- Depressed economic conditions in their service areas (cited by five companies)
- Customer resistance to higher rates, combined with conservation efforts (cited by six companies)
- Unusually fair weather (cited by two companies).

Public Positions of Pipeline Companies (continued)

New Reserve Acquisitions

Pipeline company annual reports also indicate that some companies are acquiring more extensive reserves in Canada and Mexico. At the same time, they do not anticipate acquiring new domestic supplies through the proposed Alaska pipeline. One company had already written off its investment in the pipeline when its annual report was written.

Company annual reports indicate that some companies anticipate increasing their imports while at least one company is using imports to improve its reserve positions. In all, 14 companies are or soon will be importing gas and 9 are increasing their import capacity. On the other hand, at least one company (Southern) has purchased no liquefied natural gas from Algeria for several years, although Algerian reserves are still included in the company's calculation of reserves.

5. Summary

The major interstate natural gas pipeline companies form the link between most of the Nation's natural gas producers (primarily in the Gulf and Southwestern States) and most consumers in other regions (primarily the East Coast, Midwest, and California). As a result, an analysis of these companies provides considerable information about the natural gas industry as a whole. The results of this study fall into three major categories: those concerning purchases of individual types of gas by all major interstate pipeline companies; those concerning the purchase patterns of individual interstate companies; and the public positions adopted by these companies toward major policy issues.

Purchases by NGPA Category

Volumes

Projected overall wellhead purchase volumes for the 20 companies reported here show a slight increase for the past year (about 2 percent). This slight change has occurred because old gas purchases have declined by 9 percent during the year while new gas and high-cost gas purchases have increased by 14 percent and 70 percent, respectively. (The percentage increase for high-cost gas is large because relatively small volumes of gas are involved; in absolute terms, the new gas increase is greater.)

Almost all of the decrease in old gas supplies comes from gas with contract dates of 1972 or earlier. The disappearance of such supplies can be expected due to depletion and contract expirations. Nonetheless, the decline of such supplies can have a major effect on price because they are usually the least expensive sources of gas.

Among new gas categories, Section 102 gas and Section 103 gas have both been purchased in increased quantity (18 percent for Section 102 and 12 percent for Section 103). Other new gas categories have shown little change.

Prices

Average overall wellhead prices (in constant dollars) were projected to rise by 17 percent during the year. The increase is due primarily to the shift of purchases from less to more expensive categories rather than to price increases within categories. There is, however, no evidence that companies have been converting old gas into new gas.

The price of old gas has increased by 4 percent because of the relative decline of earlier dated supplies. The dispersion of prices for both date groupings (before and after 1972) has been and remains fairly high. This reflects in part the layered price ceiling structure for old gas.

The price of new gas has risen by 4 percent, primarily because of a 5 percent increase in the price of Section 102 gas. This in turn reflects the fact that Section 102 ceiling prices have been allowed to rise in real terms. The dispersion of new gas prices overall and for individual NGPA sections is very small. This probably reflects the effect of NGPA price ceilings in determining prices.

High-cost gas prices rose rapidly during the first 6 months studied but fell slightly during the second 6 months. Dispersion of prices has been very great throughout the time period studied.

Summary (continued)

Purchases by Pipeline Companies

Projected average acquisition costs for different pipeline companies vary greatly in mid-1982, from $1.34 to $2.90 per Mcf. The companies' relative average prices have remained fairly stable, although there is some tendency for companies with low and high initial average prices to have increased more slowly than others (or to have decreased). The dispersion of pipeline company average purchase prices has remained about the same. In terms of volume, the relative position of various companies has changed only slightly because of large initial size differences. Nonetheless, company purchases have changed considerably in some individual cases. Overall, 8 companies projected declining purchase volumes, and 12 projected increased purchases.

Projected old gas purchases have decreased in absolute terms for all companies but one (Transcontinental). The degree of decrease varies, but relative positions remain largely unchanged. Relative prices among companies have remained highly stable, reflecting in part the continuing influence of previous corporate acquisition policies and market constraints.

Companies have shown considerably greater flexibility in managing their new gas purchase volumes than might have been expected; 8 companies have decreased gas purchases while 12 have increased them. Average prices for new gas are tightly bunched for the various companies. The most important difference in purchases is the mix of new gas types. Some companies purchase almost all their new gas under Section 102, while others purchase large volumes under Section 103. This has little practical consequence at the present, but could become important as the ceiling prices for the NGPA Sections diverge. The tendency to purchase new gas seems most likely to be tied to corporate policy to develop new reserves, probably based on perception of an inability to meet long-term commitments.

Projected purchase quantities and volumes of high-cost gas show great variation among interstate pipeline companies. Some companies have never purchased large volumes; others have shown continuing increases throughout the time studied; still others have decreased their purchases in the last year. In terms of prices, some companies show continuing price increases while others are registering declines. Three interesting features of the high-cost gas market may be noted:

- Those with continued low purchase volumes show continuing price increases but continue to pay relatively lower prices than other companies.

- The higher-priced end of the market softened considerably by mid-1982. There appears to be an effective cap on the average prices projected for this period. Other evidence suggests a further decline in average prices since the projections were made.

- The five companies with the highest average prices for all gas in mid-1981 have all experienced less than 15 percent increases in purchase volumes of high-cost gas.

Finally, there is no evidence that companies with large endowments of old gas have been aggressive bidders for high-cost gas, but the behavior of companies with very high average wellhead purchase costs suggests that they have become unwilling to continue bidding aggressively. This suggests that companies with large quantities of controlled gas supplies may be very well placed to bid in later years.

Pipeline Company Policy Positions

Most pipeline companies that express opinions in their annual reports favor gradual decontrol of gas prices, with some provision to mitigate severe short-run price changes. Two companies with high acquisition costs and sensitive end-use markets oppose decontrol unless old gas is exempted and the effects of indefinite price escalator clauses in contracts are minimized.

Some companies express concern about current supply surpluses. Some are considering contesting take-or-pay clauses in producer contracts. Some would also like to stiffen minimum bill provisions with customers.

Companies with large owned reserves look forward to including them under NGPA provisions at higher prices than previously allowed.

Finally, companies do not anticipate buying Alaskan gas, but several do plan to increase their importing capacity.

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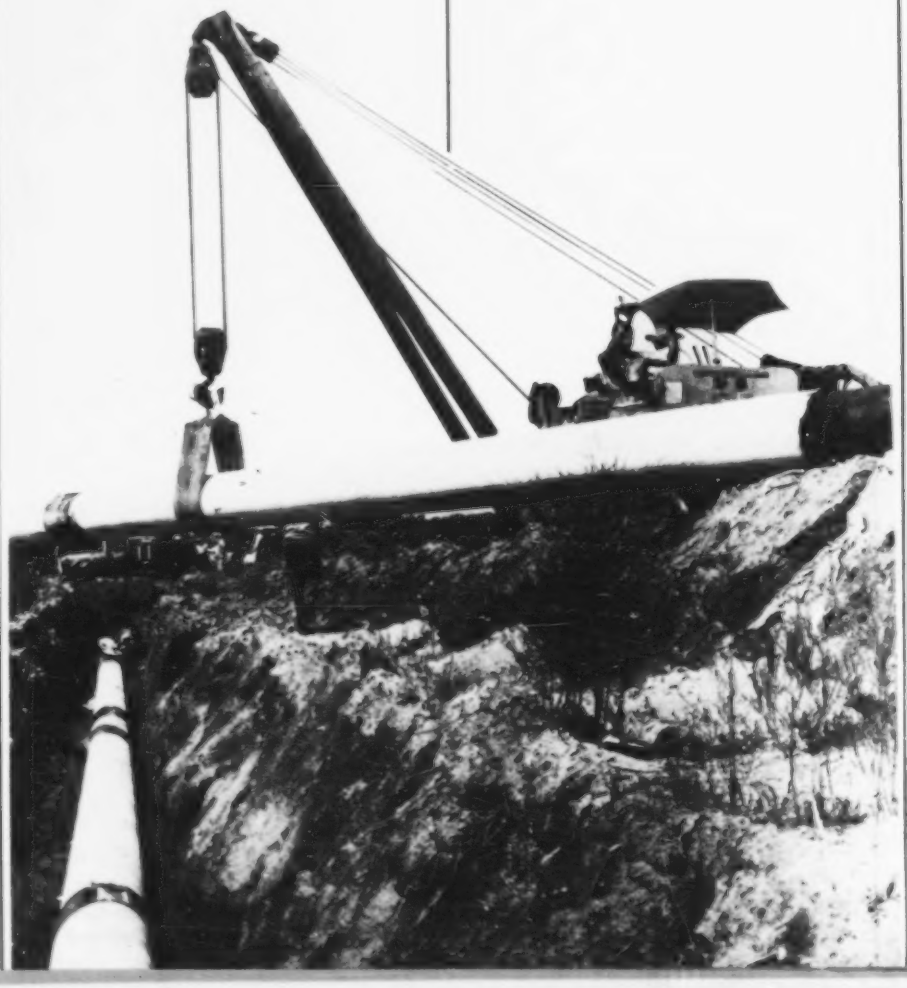
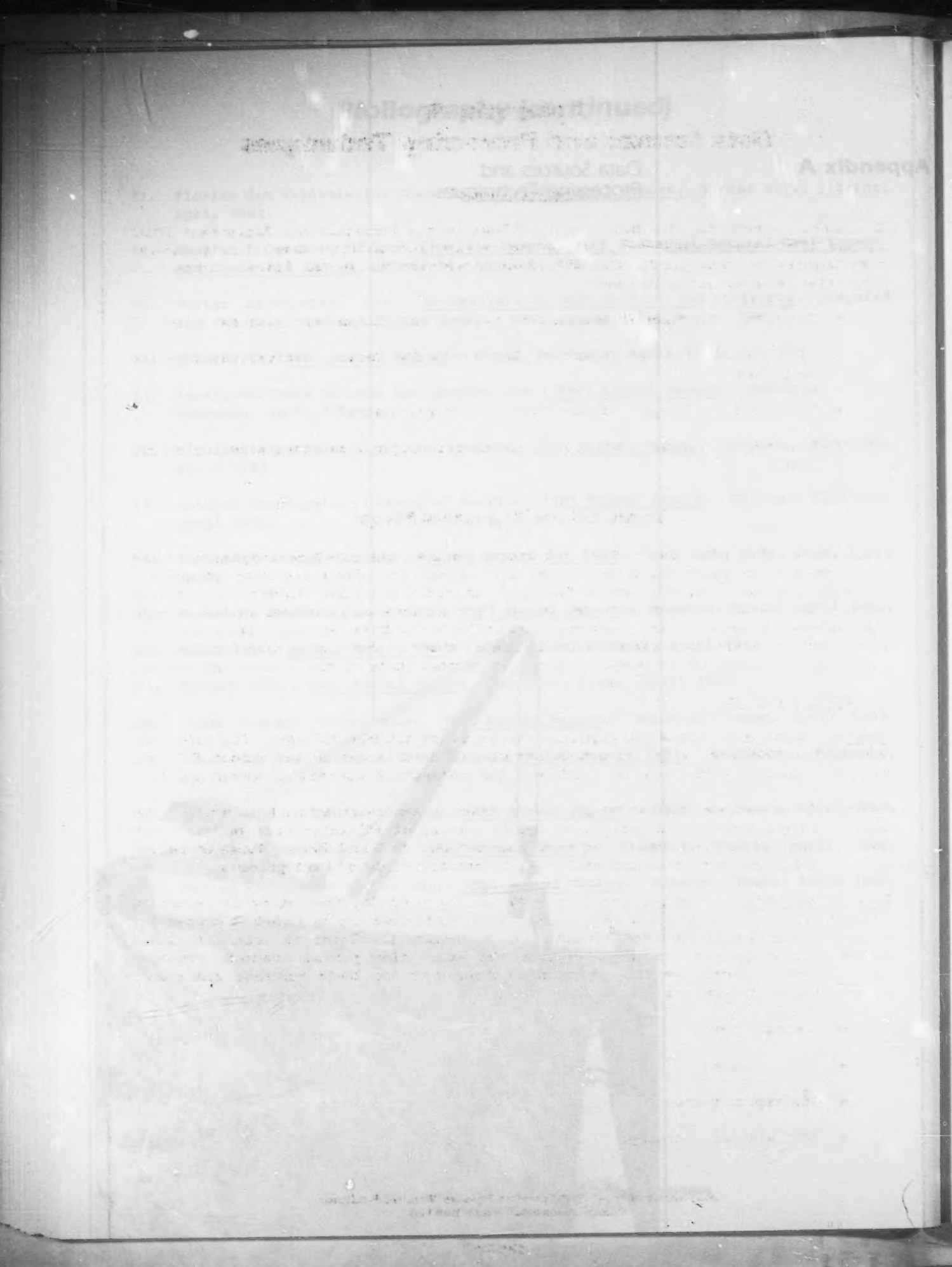
Appendix A

Data Sources and Processing Techniques





Appendix A
Data Sources and Processing Techniques

Introduction

The primary source for the data presented here is the Purchased Gas Adjustment (PGA) filings that major interstate pipeline companies submit to the Federal Energy Regulatory Commission (henceforth, the Commission), pursuant to 18 CFR 154.63. Data from four other sources are also used:

- FERC Form 2, "Annual Report for Natural Gas Companies, Classes A and B"
- FERC Form 15, "Annual Report of Gas Supply for Certain Natural Gas Pipeline Companies"
- FERC Form 16, "Report of Gas Supply and Requirements"
- A survey of annual stockholder reports from major interstate pipeline companies.

Purchased Gas Adjustment Filings

The purpose of the PGA is to allow interstate natural gas pipeline companies to recover changes in their purchase prices for natural gas above the cost of service reflected in their current tariff filings. In order to allow recovery in a timely manner, the key data reported in the PGA are projections of purchases in the immediate future. In most cases, companies report both the NGPA Section number covering each contracted purchase and the date of the contract. These data make the PGA filings a unique source of information about the current state of the natural gas market.

Description of Data

Sample. Sixty-one interstate pipeline companies submit PGA filings. Pipeline companies that transport only intrastate supplies of natural gas do not submit filings, nor do companies that have no purchased gas adjustment clauses in their tariffs.

Twenty of the largest interstate pipeline companies are included in this study. Together, they accounted for between 86 and 88 percent of all interstate wellhead purchases reported on FERC Form 2 for each year between 1976 and 1981. These companies were also the subject of an informal 1979 Commission study of NGPA prices.

Form of Submission. The portion of the PGA filing used for this study is generally referred to as the supporting cost-study. This study need not be filed in a specific format or for specified time periods. As a result, the level of detail included varies from company to company, as does the exact time period covered. In most cases, however, companies file price and volume data for their purchase contracts, along with the following:

- Contract date
- NGPA category
- Geographic source
- FERC account category.

Appendix A
Data Sources and Processing Techniques (continued)

For the twenty pipeline companies surveyed in this study, the timing of PGA submissions varies in two ways:

- Seventeen companies report data semi-annually, while three report annually.
- The dates on which the filings become effective and the periods covered by the filings vary.

Because of the lack of a specified form for PGA filings, each submission was processed separately. Major adjustments required to transform the various submissions into a single data base are described below in the section on data transformations.

Data Quality. All PGA filings include projected purchases for a defined future period. Projected volumes and prices represent the company's best estimate of natural gas purchase volumes and costs during the subsequent effective tariff period. The figures are usually derived from those of similar past periods. Some PGA filings also include "actual" volumes and prices for some past period. The two sets of figures cannot, in general, be used to check each other because the actual figures can cover periods other than past projections. To the extent that the two sets of figures can be compared, they appear to approximate but not to match each other.

For the purposes of this study, only projected figures for volumes and costs have been used. The Commission also uses the projected figures; they are considered more generally useful and accurate than the reports of actual production. The reasons for this are:

- Companies file actual reports largely as a convenience to themselves. The data are not generally subjected to the same scrutiny as projections. Moreover, pipeline companies have considerable latitude as to which time they use in reporting actual figures.
- The costs reported are always based on projections. Reported actual costs are costs derived from previous projections.
- Not all companies file actual totals. Five of the 20 companies surveyed here do not.
- As a general rule, neither projected nor actual volumes are audited. In the absence of such an audit, it is thought that actual volumes may be as subject to error as the projections.
- The projections are more current.

The general quality of PGA data is probably fairly high. Companies have a disincentive to submit implausible PGA filings. Several PGA filings have been challenged. In such cases, the filing can be suspended, and additional costs cannot be recovered until the case is resolved. Typically, such cases take many months to consider.

It appears that PGA data have become increasingly accurate and complete with each submission. The number of cases requiring imputation for missing data (for example, NGPA Section number) has been reduced, as has the incidence of obviously incorrect data. Moreover, company submissions have become increasingly consistent with each other.

Appendix A
Data Sources and Processing Techniques (continued)

Validation of Data. The data base used for this study was examined for accuracy. Purchased volumes and prices were checked against control totals taken from the hard copy of the submission on file with the Commission. The data comprising inconsistent totals were compared directly with the filing. Discrepancies were forwarded to the Commission for consideration. Errors discovered in this way were corrected, and the process was repeated until agreement was reached.

PGA data were also compared with data from FERC Form 2 to insure that the totals derived from the two sources were compatible (see Table A1). The two filings cannot be compared directly because the PGA is not usually filed for calendar years. Note also that the FERC Form 2 data are preliminary.

Table A1. Comparison of Volumes and Prices Reported in PGA Filings and in FERC Form 2

Pipeline Company Name	Volumes (Bcf)		Price (dollars per Mcf)[a]		PGA Effective Dates
	PGA	Form 2 (1981)[b]	PGA	Form 2 (1981)[b]	
Cities Service	344	293	1.54	1.90	May-Nov 1981
Colorado	281	224	2.36	2.77	Nov 1980-Nov 1981
Columbia	598	614	2.29	2.54	Mar-Sep 1981
Consolidated	104	127	2.42	2.67	Mar-Sep 1981
El Paso	1,014	1,113	2.00	2.25	Apr-Oct 1981
Florida	137	136	1.91	1.83	Apr-Oct 1981
Kansas-Nebraska	76	61	1.69	1.67	Dec 1980-Dec 1981
Michigan-Wisconsin	540	543	1.93	2.20	May-Nov 1981
Natural	848	838	1.77	1.82	Mar-Sep 1981
Northern	727	770	1.68	1.65	Nov 1980-Nov 1981
Northwest	135	132	1.97	2.16	Apr-Oct 1981
Panhandle Eastern	512	526	1.57	1.64	Mar-Sep 1981
Southern	449	459	2.66	2.52	Jan 1981-Jan 1982
Tennessee	1,056	1,070	1.98	1.99	Jan 1981-Jan 1982
Texas Eastern	532	493	1.26	1.20	Feb 1981-Feb 1982
Texas Gas	463	426	2.07	2.04	Feb 1981-Feb 1982
Transcontinental	849	901	2.77	2.56	Mar-Sep 1981
Transwestern	269	248	1.80	2.10	Apr-Oct 1981
Trunkline	591	535	2.40	2.46	Mar-Sep 1981
United Gas	651	765	2.30	2.46	Jan 1981-Jan 1982

[a]All PGA prices are in terms of January 1982 dollars.
[b]Pre-publication volumes.

Appendix A
Data Sources and Processing Techniques (continued)

The results of this comparison suggest that PGA filings approximate the best currently available source for aggregate information, but do not match it very closely. Volumes can differ by as much as 20 percent (though many are very close). There is no consistent pattern of volume differences. In the case of prices, there appear to be two patterns: either the two reports agree quite closely, or else the PGA projects prices 10 to 20 percent lower than those reported on Form 2. The reason for such consistent discrepancy is at present unknown.

In general, differences between PGA filings and Form 2 information may be due to a variety of causes, including:

- PGA filings are projections that may not always reflect future behavior accurately.
- Companies may use different methods to obtain PGA projections.
- There may be systematic differences in reporting practices between the two reports for some or all companies.

The PGA filings contain a rough indication of the error due to using projections in the form of the surcharge adjustment. The surcharge adjustment is used to recover purchase costs beyond those expected or to repay costs below those expected. The surcharge adjustment cannot be applied directly to PGA filings because:

- It contains only a summary figure for all differences from projected levels. This includes costs of pipeline purchases and imports.
- No volumes are directly reported. A cost per Mcf figure is reported but is based on projected future purchases only.
- It covers time periods different from previous projections. Normally, the surcharge adjustment covers a period from nine to three months prior to the beginning of a new projection period.

Nonetheless, surcharge adjustment figures provide an indication of how accurate PGA projections are (see Table A2). In most cases, the surcharge adjustment appears to indicate that the use of projections accounts for some, but not all, of the difference between PGA and Form 2 data.

Until it is possible to determine the source of discrepancies between these two reports, conclusions based on PGA data should be taken as tentative. The PGA filings remain the only source of information for analyzing gas categories, however, and the data problems do not appear to be crippling for purposes of drawing general conclusions.

No further validation of the PGA data has been performed because of the difficulties involved in such a process. There are some procedural issues that may affect the accuracy of filings, however. PGA filings are not intended to serve as data collection instruments per se but as a part of an overall regulatory system for natural gas. Questions concerning the data are usually aired during Commission rate hearings, where the primary concern is resolution of legal issues. No attempt is made to revise PGA submissions to reflect the results of such questioning. In addition, most PGA filings are protested and the resulting tariffs are suspended for a time. In cases

of successful protests, a new PGA must be filed. The precise status of data on a given current submission becomes difficult to judge.

Interpretation of Data. The projected purchase cost for each contract volume represents the pipeline company's estimates of the purchase costs it will incur during the coverage period of the filing. These costs include:

- The average price to be paid to the producer
- Gathering charges
- Transportation charges
- Taxes.

Table A2. PGA Surcharge Adjustments

Pipeline Company Name	Surcharge Adjustment (dollars per Mcf)[a,b]	Period during Which Surcharge Account Accrued	Difference between PGA and FERC Form 2 Prices from Table A1[b]
Cities Service	0.20	Feb-Aug 1981	0.36
Colorado	0.08	Jul 1980-Jun 1981	0.41
Columbia	0.18	Jul-Dec 1981	0.25
Consolidated	0.12	Jun-Dec 1981	0.25
El Paso	0.37	Jan-Jul 1981	0.25
Florida	0.00	Jan-Jun 1981	-0.08
Kansas-Nebraska	0.07	Aug 1980-Jul 1981	-0.02
Michigan-Wisconsin	0.18	Feb-Jul 1981	0.27
Natural	0.07	Apr-Aug 1981	0.05
Northern	0.14	Oct 1980-Sep 1981	-0.03
Northwest	0.00	Jan-Jun 1981	0.19
Panhandle Eastern	-0.01	Jun-Nov 1981	0.07
Southern	0.08	Mar-Sep 1981	-0.14
Tennessee	-0.12	Apr-Oct 1981	0.01
Texas Eastern	0.05	Dec 1981-Jun 1982	-0.06
Texas Gas	0.12	May-Oct 1981	-0.03
Transcontinental	-0.18	Jun-Dec 1981	-0.19
Transwestern	0.35	Jun-Nov 1981	0.30
Trunkline	0.33	Jun-Nov 1981	0.06
United Gas	0.18	Oct 1981-Apr 1982	0.16

[a]Price differences as reported in PGA.
[b]Figures should be compared with caution (see text).

Appendix A
Data Sources and Processing Techniques (continued)

Royalty payments and payments for gas not received under take-or-pay clauses are among the costs not included.

Projected volumes reported in the PGA filings are generally based on actual volumes for a similar preceding period (though they are typically adjusted to fit current market conditions). For the purposes of this study, a number of projected gas purchases reported in the PGA filings have not have been considered because they would have resulted in significant double-counting. They are:

- Purchases from other pipelines
- Imports
- Exchange gas.

In addition, cost-of-service gas (a company's own production from specific leaseholds of pre-NGPA gas) is not considered because it is not covered by the NGPA and because most companies do not include it in their PGA filings.

The reports included in this study are therefore designed to cover a specific part of the overall national gas market: wellhead purchases that are both subject to the NGPA and dedicated to the interstate market.

Data Transformations

Data obtained directly from the PGA filings could be misleading because of reporting inconsistencies among different pipeline companies and among different submissions for the same companies. In order to make the data as consistent as possible and to impute for some missing data, the following data transformations were undertaken before beginning analysis:

- Assignment of submissions to roughly comparable time periods
- Imputation of missing or erroneous NGPA category data
- Imputation of contract vintage
- Interpolation for intermediate time periods for companies that file PGA submissions annually
- Adjustment of prices to reflect constant dollars
- Revintaging of rollover gas contracts (NGPA Section 106)
- Extrapolation of vintage data for some old gas volumes for some companies
- A number of other small adjustments: for example, to correct for different pressure bases used in reporting.

These procedures are explained in detail below.

Appendix A
Data Sources and Processing Techniques (continued)

Assignment of Time Period. There is no set reporting period for PGA filings. As a result, the filings for each company cover somewhat different periods. In order to allow comparison of results, two strategies were possible:

- To derive monthly rates based on the PGA filings in effect during each month
- To assign each PGA filing to a period so that the filings of all companies would have roughly comparable effective dates.

For this study, the second method was chosen. It is the less cumbersome of the two. It also avoids a problem inherent in the first approach: the results change from month to month not because of a general change in market conditions but because of changed data for the companies whose filings happen to become effective at that time. The cost of using the second approach is that it is impossible to interpret the time periods precisely.

Table A3 shows the dates on which each PGA filing considered in this study became effective, and the midpoint of the time period covered. In summary it may be seen that the midpoints of the periods covered are grouped as follows:

- Mid-1981: April to August 1981
- Late 1981 - Early 1982: October 1981 to February 1982
- Mid-1982: April to August 1982.

Imputation of NGPA Category Data. NGPA categories are not included in part or all of some PGA filings. To make filings comparable, contracts with no reported NGPA Section were assigned one based on cost. The same procedure was used for reported NGPA Sections when the prices were obviously inappropriate. In all, 10 percent of the volume was subjected to this procedure in mid-1981, 6 percent in late 1981 - early 1982, and 4 percent in mid-1982. The minimum and maximum costs used to impute NGPA category data are reported in Tables A4, A5, and A6, along with the volumes of gas affected. The cutoff costs between categories were determined by the NGPA maximum lawful rates at the appropriate time. Differences in cutoff levels between companies may represent the lack of any purchase costs in the relevant range or slight timing differences.

The effect of this procedure is to reduce within-category variance slightly. To a slight extent also, the procedure results in greater differentiation between gas types than might have been apparent if real data had been available. In the aggregate, such effects should be small; for two individual companies (Cities Service and Northern), however, large volumes were assigned imputed NGPA categories. Values for these are therefore less reliable than those for others. Data for individual gas categories to which these companies apparently contribute large relative volumes (for instance, stripper well gas) should also be treated with caution.

Appendix A
Data Sources and Processing Techniques (continued)

Table A3. PGA Time Periods: Dates on Which Filings Took Effect and Midpoints of Time Periods Covered

Pipeline Company Name	Mid-1981		Late 1981 - Early 1982		Mid-1982	
	Effective Date	Mid-Point	Effective Date	Mid-Point	Effective Date	Mid-Point
Cities Service	May 81	Aug 81	Nov 81	Feb 82	May 82	Aug 82
Colorado	Oct 80	Apr 81		[a]	Oct 81	Apr 82
Columbia	Mar 81	Jun 81	Sep 81	Dec 81	Mar 82	Jun 82
Consolidated	Mar 81	Jun 81	Sep 81	Dec 81	Mar 82	Jun 82
El Paso	Apr 81	Jul 81	Oct 81	Jan 82	Apr 82	Jun 82
Florida	Apr 81	Jul 81	Oct 81	Jan 82	Apr 82	Jul 82
Kansas-Nebraska	Dec 80	Jun 81		[a]	Dec 81	Jun 82
Michigan-Wisconsin ..	May 81	Aug 81	Nov 81	Feb 82	May 82	Aug 82
Natural	Mar 81	Jun 81	Sep 81	Dec 81	Mar 82	Jun 82
Northern[b]	Nov 80	Jun 81		[a]	Nov 81	Jun 82
Northwest	Apr 81	Jul 81	Oct 81	Jan 82	Apr 82	Jul 82
Panhandle Eastern ..	Mar 81	Jun 81	Sep 81	Dec 81	Mar 82	Jun 82
Southern	Jan 81	Apr 81	Jul 81	Oct 81	Jan 82	Apr 82
Tennessee	Jan 81	Apr 81	Jul 81	Oct 81	Jan 82	Apr 82
Texas Eastern	Feb 81	May 81	Aug 81	Nov 81	Feb 82	May 82
Texas Gas	Feb 81	May 81	Aug 81	Nov 81	Feb 82	May 82
Transcontinental ...	Mar 81	Jun 81	Sep 81	Dec 81	Mar 82	Jun 82
Transwestern	Apr 81	Jul 81	Oct 81	Jan 82	Apr 82	Jul 82
Trunkline	Mar 81	Jun 81	Sep 81	Dec 81	Mar 82	Jun 82
United Gas	Jan 81	Apr 81	Jul 81	Oct 81	Jan 82	Apr 82

[a]Filings are annual. Data for this time period are averages of first and third submission.

[b]Northern projections are for the calendar year even though its effective date is November 1981.

Appendix A
Data Sources and Processing Techniques (continued)

Table A4. Threshold Prices Used to Impute Missing NGPA Category Data Mid-1981 (Midpoint April-August 1981)

Pipeline Company Name	Imputed Volume (Bcf)	Percent of Total NGPA Volume	Cutoff Prices (cents) Low Rate	Cutoff Prices (cents) High Rate	Assigned NGPA Category
Cities Service	221	55	12.500	197.845	104
			213.887	252.110	103
			261.613	305.899	102
			327.441	343.769	108
			345.004	500.000	107
Colorado	16	4	14.000	226.790	104
			235.190	286.430	103
			334.670	363.820	102
Columbia	12	3	52.809	202.432	104
Consolidated	2	2	30.000	47.833	104
El Paso	110	12	91.880	203.810	104
			269.330	275.600	103
			323.740	334.310	102
Michigan-Wisconsin ..	20	4	24.069	122.380	104
			248.170	252.489	103
Northern	321	60	10.000	189.999	104
			190.000	279.999	103
			280.000	309.999	102
			310.000	374.999	108
			375.000	999.999	107
Northwest	24	8	12.000	156.838	104
			164.479	271.482	103
			283.378	416.266	102
Panhandle Eastern ...	(a)	(a)	11.000	250.907	104
			253.866	295.882	103
			297.199	395.517	102
			401.328	617.906	107
Southern	3	(a)	22.790	95.490	104
			292.450	300.200	102
Tennessee	6	1	17.243	149.785	104
Texas Eastern	183	10	14.679	159.194	104
Texas Gas	5	8	13.300	83.700	104
Transcontinental ...	1	1	20.220	220.503	104
			240.498	266.972	103
			314.520	314.520	102
Transwestern	(a)	1	26.760	141.390	104

[a]Less than 0.5 Bcf or 0.5 percent.

Table A5. Matrices Used to Assign NGPA Category Codes to Transactions Where None Were Given by the Company, Late 1981 - Early 1982 (Midpoint October 1981 to February 1982)

Pipeline Company Name	Imputed Volume (Bcf)	Percent of Total NGPA Volume	Cutoff Prices (cents) Low Rate	Cutoff Prices (cents) High Rate	Assigned NGPA Category
Cities Service	201	56	12.500	224.999	104
			227.500	266.399	103
			274.600	321.999	102
			328.100	481.999	108
			527.000	600.999	107
Columbia	14	3	53.000	160.000	104
Consolidated	2	2	30.000	48.000	104
El Paso	176	15	84.841	251.568	104
			278.866	296.008	103
			343.417	368.831	102
Michigan-Wisconsin ...	12	4	24.734	196.546	104
Northwest	[a]	[a]	12.000	159.910	104
			264.520	264.520	103
Panhandle Eastern	[a]	[a]	14.282	262.970	104
			266.148	320.231	103
			321.527	461.850	102
			596.876	731.448	107
Southern	2	[a]	22.790	81.080	104
			302.850	311.000	103
			330.000	330.000	102
Texas Gas	2	4	13.300	74.500	104
			312.900	312.900	103
Texas Eastern	200	15	14.679	263.705	104
			301.562	316.802	103
Tennessee	10	1	14.600	147.900	104
Transcontinental	2	1	20.220	260.490	104
			325.331	325.548	102

[a]Less than 0.5 Bcf or 0.5 percent.

Table A6. Matrices Used to Assign NGPA Category Codes to Transactions Where None Were Given by the Company, Mid-1982 (Midpoint April to August 1982)

Pipeline Company Name	Imputed Volume (Bcf)	Percent of Total NGPA Volume	Cutoff Prices (cents) Low Rate	High Rate	NGPA Category
Cities Service	165	52	12.500	245.999	104
			246.000	290.999	103
			292.000	345.999	102
			346.000	499.999	108
			500.000	850.000	107
Colorado	15	4	14.410	217.780	104
			233.070	249.980	103
			299.030	379.650	102
			827.170	999.999	107
Columbia	14	4	53.000	163.000	104
Consolidated	2	2	29.000	49.000	104
El Paso	139	12	86.841	254.758	104
			286.288	289.000	103
			301.000	372.000	102
			407.000	999.999	107
Northwest	([a])	([a])	10.000	177.000	104
			204.974	205.000	103
			329.000	330.000	102
Texas Gas	2	3	10.000	100.000	104
Tennessee	11	3	14.000	149.000	104
Transcontinental ..	([a])	([a])	98.000	177.000	104

[a]Less than 0.5 Bcf or 0.5 percent.

Imputation for Contract Date. Three companies either submitted no contract vintage data for some of their filings or submitted data that were inconsistent. Contract vintage data were imputed for less complete submissions of these companies so that totals for all companies could be compared. This procedure was undertaken only for old gas contract vintages. Problematic submissions were as follows:

- El Paso submitted no contract vintage data for its mid-1981 and late 1981 - early 1982 filings. It did submit data for mid-1982.
- Michigan-Wisconsin reported relatively complete contract vintage data for its mid-1981 filing. For later filings, many data are missing from the contracts that had been dated after 1972 in the earlier submissions.
- Kansas-Nebraska reported all its contracts as late vintage (post 1972) on its mid-1981 filing. It submitted no late 1981 - early 1982 filing because it submits annually. In its mid-1982 filing, contract vintages are plausibly reported.

The imputation procedure was as follows:

- For each company, the most complete report was chosen as the base submission (mid-1982 for Kansas-Nebraska and El Paso, mid-1981 for Michigan-Wisconsin).
- The percentage of old gas with contract vintages before and after 1972 (and of unknown contract vintage) was determined.
- These percentages were then applied to the total old gas reported on less complete submissions to obtain the estimate of volumes covered by each vintage category for each company.
- The percentage of total expenditures on each vintage category for the base period was obtained.
- The total expenditures on old gas for other periods was prorated to match the base period.
- The average price for each vintage category was obtained by dividing imputed expenditures by imputed volumes.

This procedure is designed to produce only approximate results. It does not consider the possibility that percentages of the various vintage categories have shifted, nor does it allow for the possibility of variation over 6-month periods. It does, however, allow totals for all periods to be based on reports from all companies rather than from a varying selection. When summary statistics are reported by contract rather than by pipeline company totals, no imputation is included.

Interpolation for Intermediate Periods for Annual Reporters. The three companies that report annually submitted no direct report for late 1981 - early 1982. In order to make totals for the three periods comparable, figures were interpolated for late 1981 - early 1982, using an average of the two annual reports (each of which was, in fact, designed to cover part of the "missing" period).

Appendix A
Data Sources and Processing Techniques (continued)

Cost Deflators. All costs were normalized to January 1982 dollars. The deflation factor applied was developed from the NGPA ceiling price tables published quarterly and is used by the Commission to compute monthly maximum lawful wellhead prices under Title 1, Subtitle A, Section 101(a)(1): "... the sum of A) a factor equal to one hundredth of the quarterly percent change in the GNP implicit price deflator; plus B) a correction factor of 1.002." The procedure corrects for much of the effect of inconsistency in reporting periods among companies. Tables A7, A8, and A9 present the factors applied to each submission.

Revintaging of Section 106 Gas. Rollover contracts are covered by Section 106. To qualify for Section 106 pricing, a contract must have been renegotiated since passage of the NGPA. In some cases, pipeline companies continued to report the date of the original contract as the vintage. To make reports consistent, all Section 106 gas has been given a post-NGPA contract vintage.

Table A7. Inflation Correction Factors, Mid-1981

Pipeline Company Name	PGA Filing Time Coverage	Inflation Correction Factor
Cities Service	May-Nov 1981	1.035
Colorado	Nov 1980-Nov 1981	1.059
Columbia	Mar-Sep 1981	1.046
Consolidated	Mar-Sep 1981	1.046
El Paso	Apr-Oct 1981	1.041
Florida	Apr-Oct 1981	1.041
Kansas-Nebraska	Dec 1980-Dec 1981	1.046
Michigan-Wisconsin	May-Nov 1981	1.035
Natural	Mar-Sep 1981	1.046
Northern	Jan-Dec 1981	1.041
Northwest	Apr-Oct 1981	1.041
Panhandle Eastern	Mar-Sep 1981	1.046
Southern	Jan-Jul 1981	1.059
Tennessee	Jan-Jul 1981	1.059
Texas Eastern	Feb-Aug 1981	1.053
Texas Gas	Feb-Aug 1981	1.053
Transcontinental	Mar-Sep 1981	1.046
Transwestern	Apr-Oct 1981	1.041
Trunkline	Mar-Sep 1981	1.046
United Gas	Jan-Jul 1981	1.059

Appendix A
Data Sources and Processing Techniques (continued)

Extrapolation of Data. Contract vintage information was missing for some old gas reported on some individual submissions. The proportions of vintage categories were estimated from other submissions of the same companies. The effect of these extrapolations is to damp out (slightly) changes between time periods for aggregate figures. Extrapolated figures for individual companies are always identified as such.

Table A8. Inflation Correction Factors, Late 1981 - Early 1982

Pipeline Company Name	PGA Filing Time Coverage	Inflation Correction Factor
Cities Service	Nov 1981-May 1982	0.993
Colorado	(None)	
Columbia	Sep 1981-Mar 1982	1.007
Consolidated	Sep 1981-Mar 1982	1.007
El Paso	Oct 1981-Apr 1982	1.000
Florida	Oct 1981-Apr 1982	1.000
Kansas-Nebraska	(None)	
Michigan-Wisconsin	Nov 1981-May 1982	0.993
Natural	Sep 1981-Mar 1982	1.007
Northern	(None)	
Northwest	Oct 1981-Apr 1982	1.000
Panhandle Eastern	Sep 1981-Mar 1982	1.007
Southern	Jul 1981-Jan 1982	1.022
Tennessee	Jul 1981-Jan 1982	1.022
Texas Eastern	Aug 1981-Feb 1982	1.015
Texas Gas	Aug 1981-Feb 1982	1.015
Transcontinental	Sep 1981-Mar 1982	1.007
Transwestern	Oct 1981-Apr 1982	1.000
Trunkline	Sep 1981-Mar 1982	1.007
United Gas	Jul 1981-Jan 1982	1.022

Appendix A
Data Sources and Processing Techniques (continued)

Miscellaneous Adjustments. Slight reporting discrepancies among the companies required further minor adjustments to the data base. The adjustments are as follows:

- All volumetric projections have been converted to annual rates.
- In their PGA filing, many companies, in whole or in part, reported their gas volumes at a pressure base other than 14.73 psia. Volumes provided at the other pressure bases (14.65 and 15.025) were adjusted to the 14.73 psia level. The factors used in the adjustment were:
  - Volume (at 14.65) x 0.9946 = Volume (at 14.73)
  - Volume (at 15.025) x 1.02 = Volume (at 14.73).
- Volumetric data are presented in cubic foot units (Mcf, Mmcf, etc.), although several companies reported in therms for their hardcopy filings. Volumes in cubic feet were available on tape files.
- All prices are reported in cents (or dollars and cents) per Mcf.

Table A9. Inflation Correction Factors, Mid-1982

Pipeline Company Name	PGA Filing Time Coverage	Inflation Correction Factor
Cities Service	May-Nov 1982	0.971
Colorado	Nov 1981-Nov 1982	0.983
Columbia	Mar-Sep 1982	0.977
Consolidated	Mar-Sep 1982	0.977
El Paso	Apr-Oct 1982	0.974
Florida	Apr-Oct 1982	0.974
Kansas-Nebraska	Dec 1981-Dec 1982	0.977
Michigan-Wisconsin	May-Nov 1982	0.971
Natural Gas	Mar-Sep 1982	0.977
Northern	Jan-Dec 1982	0.974
Northwest	Apr-Oct 1982	0.974
Panhandle Eastern	Mar-Sep 1982	0.977
Southern	Jan-Jul 1982	0.983
Tennessee	Jan-Jul 1982	0.983
Texas Eastern	Feb-Aug 1982	0.980
Texas Gas	Feb-Aug 1982	0.980
Transcontinental	Mar-Sep 1982	0.977
Transwestern	Apr-Oct 1982	0.974
Trunkline	Mar-Sep 1982	0.977
United Gas	Jan-Jul 1982	0.983

Appendix A
Data Sources and Processing Techniques (continued)

Supplementary Data Sources

Although the PGA filings are the only source of information on volumes and costs of natural gas by NGPA category, they are not the only sources of information about the interstate market more generally. Indeed, they are not the best sources for data about the volumes and costs of a pipeline company's total purchases.

PGA data were supplemented with data from three other sources as follows:

- FERC Form 2 was used as the best available data source for overall purchase volumes and prices. (Figures for 1981 are preliminary.)
- FERC Form 15 was used for data on reserves and owned production. (Figures for 1981 are preliminary.)
- FERC Form 16 was used for data on natural gas curtailments during the winter of 1976-1977.
- Stockholder reports for the 20 pipeline companies were analyzed to obtain information about public-company positions about a number of policy issues (for instance, deregulation, contract arrangements, and response to changing market conditions).

FERC Form 2

FERC Form 2, "Annual Report of Class A & B Pipeline Companies," collects data from approximately 90 interstate pipeline companies, as required by the Natural Gas Act of 1938. Class A and B companies are those with annual operating revenues of more than $1,000,000. Information from FERC Form 2 is published in the annual report "Statistics of Interstate Natural Gas Pipeline Companies" (DOE/EIA-0145).

Data elements obtained from FERC Form 2 include volumes and average costs for the following:

- Producer contract purchases covered by Commission account numbers 800, 801, and 802 (wellhead, fieldline, and gas plant purchases). These are purchases made under interstate producer contracts dedicated to the pipeline company.
- Other purchases covered by Commission account numbers 803, 804, 805, and 806. These purchases include synthetic natural gas (SNG), liquefied natural gas (LNG), imports, and purchases from other pipeline companies.

FERC Form 15

FERC Form 15, "Annual Report of Gas Supplies of Interstate Pipeline Companies," was instituted in 1962, in accordance with CFR 260.7. It is filed by about 90 interstate pipeline companies each year. FERC Form 15 collects data on production, reserves, and deliverability of natural gas by reservoir, field, and sources of supply. Many FERC Form 15 data are published in "Gas Supplies of Interstate Natural Gas Pipeline Companies" (DOE/EIA-0167).

Appendix A
Data Sources and Processing Techniques (continued)

FERC Form 15 data on reserves and production are used in this study. They are divided into supply sources as follows:

- Company-owned
- Producer contracts
- Other sources
  - Pipeline contracts
  - Synthetic natural gas and liquid natural gas
  - Imports.

FERC Form 16

FERC Form 16, "Report of Gas Supply and Requirements," collects data from about 50 interstate pipeline companies twice a year, as required under Public Law 95-91 and Federal Power Commission Orders 489 and 523. The Commission uses information from FERC Form 16 to analyze the supply position of reporting companies. On the basis of such analysis, the Commission may rule on the appropriateness of company curtailment plans and adjustments.

Data elements obtained from FERC Form 16 for this study are the volumes of natural gas curtailments reported by each company in the winter of 1976-1977.

Annual Stockholders Reports

Since 1978, natural gas pipeline companies have faced a market structured both by the provisions of the NGPA itself and by secondary economic reactions to its passage. The market continues to be in a state of some flux. In this situation, the attitudes of industry participants can be important in two ways:

- They provide some evidence of the companies' perceptions of their own positions and interests.
- They provide evidence of the companies' perceptions of the nature of the market.

In order to examine publicly expressed pipeline company perceptions of a number of key policy issues, annual corporate reports were studied. The reports were analyzed to determine what position (if any) each pipeline company expressed with regard to:

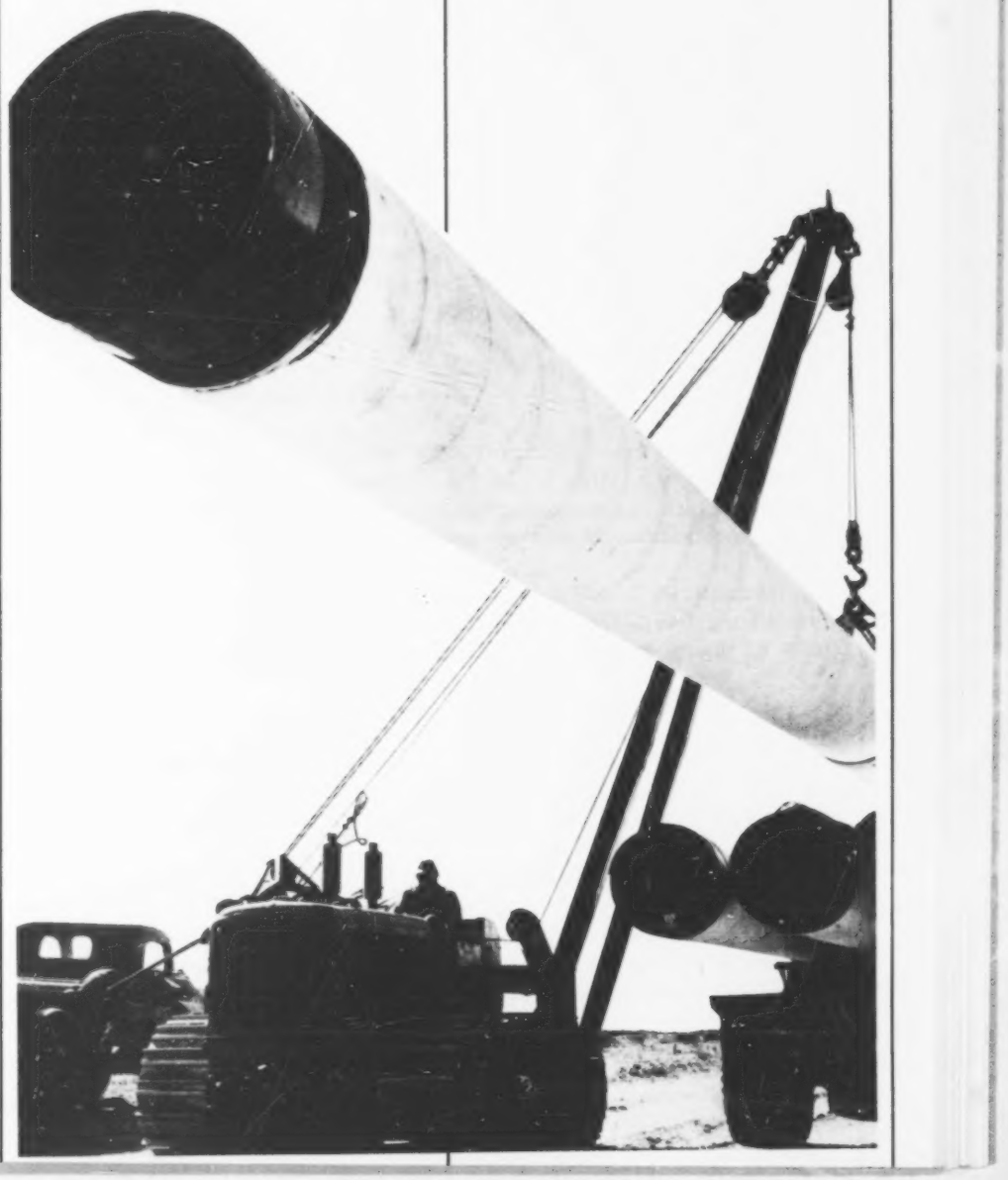
- Deregulation
- Take-or-pay contract provisions
- Reserve positions
- Acquisition of new sources of supply
- Curtailments

- Expenditures on exploration, research, and development
- Current and future demand.

The annual report survey is in no sense a rigorous study; results should be taken as being purely exploratory. Nonetheless, a number of the company comments are striking enough to warrant consideration.

Appendix B

Profiles of Major Interstate Natural Gas Pipeline Companies



Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies

Introduction

This appendix summarizes available information about the 20 major interstate pipeline companies included in this report. It provides an introduction, two tables, and three figures for each company. The items are in the following order:

- An introduction, in the form of a brief description of the pipeline company. The composites were developed from information available in the FERC Form 2, the FERC Form 15, and the FERC publication "Commission Staff Report: Impact of 1980-1981 Winter Gas Supply for Twenty-Eight Pipeline Companies," Packet Nos. TC80-60 et al., September 1980, and the companies' own annual stockholders reports.

- A figure, "Pipeline System Diagram," which is a map of the company's operating pipeline system.

- A table, "Pipeline Supplies and Average Purchase Prices, 1977-1981," which summarizes data from FERC Forms 2 and 15 concerning:

  - Reserves

  - Total purchase and production volumes

  - Average purchase costs.

- A table, "PGA Projected Volumes and Prices of Natural Gas Wellhead Purchases, 1981-1982," that summarizes data from PGA filings concerning:

  - Wellhead purchase volumes for major gas categories

  - Average purchase costs for major gas categories.

- A figure, "Projected Volumes and Prices of Natural Gas Wellhead Purchases of Major Gas Types, 1981-1982," showing the prices of old, new, and high-cost gas purchases, as reported in PGA filings, and the percentage contribution of each type of gas to the total projected purchases by the pipeline company.

- A figure, "Projected Changes in Volumes and Costs of Wellhead Purchases of Major Gas Types, 1981-1982," showing the proportions of wellhead purchase volumes and costs devoted to old, new, and high-cost gas, as reported in PGA filings.

Explanation of Tables

Pipeline Supplies and Average Purchase Prices, 1977-1982

Purchase data on these tables are taken from FERC Form 2. Purchases under producer contracts cover wellhead, fieldline, and gas plant purchases. Other purchases include LNG, SNG, imports, and purchases from other pipeline companies. Prices include all costs incurred by the company in purchasing gas (except its own incidental expenses) divided by the volume purchased. All prices are in unadjusted dollars.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Data on reserves, owned production, and import volumes are taken from FERC Form 15. Contract reserves are domestic reserves dedicated to the company under interstate contracts with producers. Owned production is priced at cost-of-service levels allowed by the Commission.

PGA Projected Volumes and Prices of Natural Gas Wellhead Purchases, 1981-1982

These tables report volumes and prices for wellhead, fieldline and gas plant purchases of various types of gas as reported on the company's PGA filings. If no data are available (because, for instance, of annual reporting instead of semi-annual) or if the volume of missing data is very large, no figures are reported. All volumes are reported as annual rates. All prices are reported in constant January 1982 dollars.

Explanation of Figures

Pipeline System Diagram

These figures are maps of each pipeline company's operating system as of March 31, 1980, according to the Commission.

Projected Volumes and Prices for Wellhead Purchases of Major Gas Types, 1981-1982

These figures consist of two parts. The first shows the volumes of old, new, and high-cost gas as percentages of total wellhead, fieldline, and gas plant purchases for each PGA filing. Old gas is considered to be all gas covered by Sections 104 and 106 of the NGPA. New gas includes all gas covered by Sections 102, 103, 108, and 109 of the NGPA. High-cost gas includes gas covered by Section 107 of the NGPA. Miscellaneous supplies (Sections 105, 311 and 312) are not included in these figures.

The second part of the figures shows the average purchase prices for old, new, and high-cost gas for each PGA filing. Prices include payments to producers, gathering charges, transportation charges, and taxes. All prices are expressed in constant January 1982 dollars.

For companies that submit annual reports, values are interpolated for late 1981 - early 1982 by averaging mid-1981 and mid-1982 data.

Projected Changes in Volumes and Costs of Wellhead Purchases of Major Gas Types, 1981-1982

These figures consist of three histograms. The first histogram (labeled "Volume") shows the composition of a company's wellhead, fieldline and gas plant purchase volumes for each PGA filing. Total volumes are divided into old, new, high-cost and other volumes. Old gas is that covered by NGPA Sections 104 and 106. New gas is that covered by NGPA Sections 102, 103, 108, and 109. High-cost gas is that covered by NGPA Section 107. Other (miscellaneous) gas is that covered by NGPA Sections 105, 311, and 312. All totals are normalized to the intermediate PGA filing (late 1981 - early 1982), so that the total volume for that period always appears as 100 percent.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

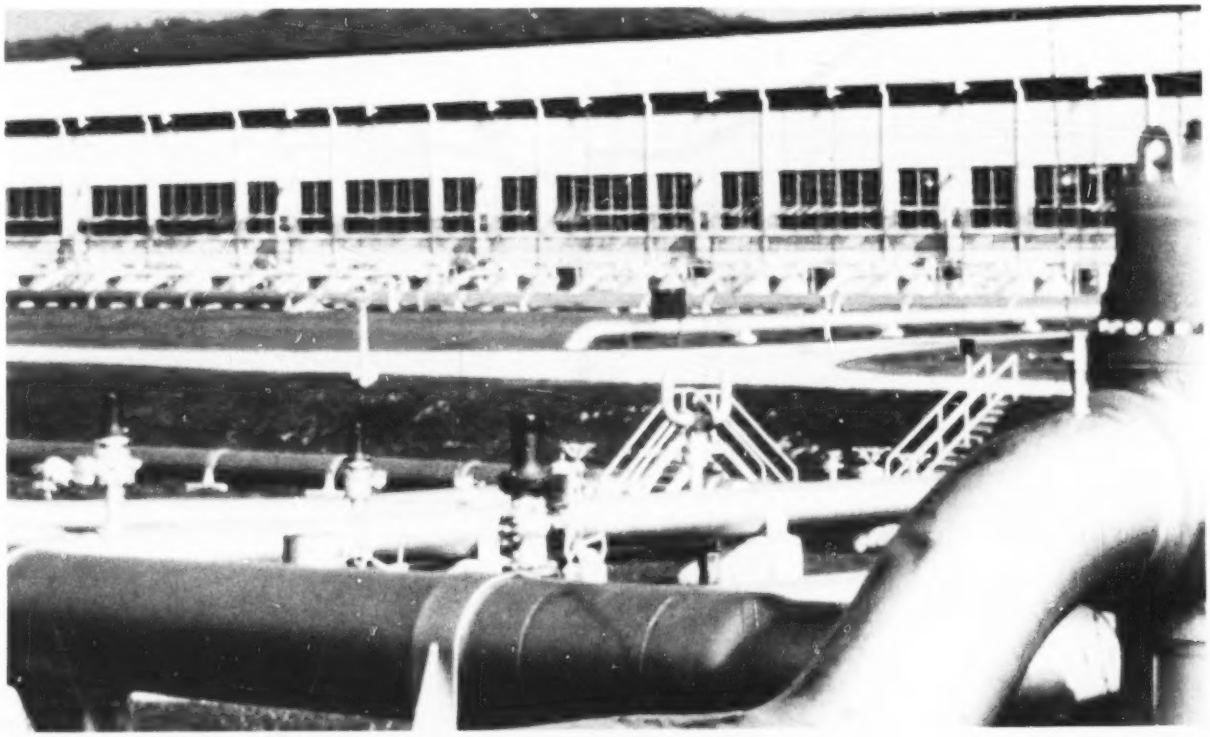
The second histogram (labeled "Costs I") shows the composition of a company's costs for wellhead, fieldline and gas plant purchases of major gas types for each PGA filing. Costs are defined as volumes multiplied by average prices (in constant January 1982 dollars). Total costs are composed of those attributable to old, new, high-cost, and other gas purchases. The cost attributable to a particular gas type is defined as the volume of the type purchased multiplied by the average price paid. The histogram is normalized to costs for the intermediate PGA filing (late 1981 - early 1982) so that total costs for that period always appear as 100 percent.

The third histogram (labeled "Costs II") presents the same information as the second, but is normalized differently so that companies can be compared. (The second histogram does not allow comparisons because each is normalized separately.) The procedure is as follows:

- The company's costs for late 1981 - early 1982 are normalized first. This is done by multiplying 100 percent by the ratio of the company's average purchase price to the average purchase price for all companies. Thus, if a company's purchase price were 70 percent of the overall average, its costs in late 1981 - early 1982 are set equal to 70 percent (rather than 100 percent as in the second histogram).

- The company's costs for the other periods are then prorated to maintain the same relationships as seen in the second histogram.

For companies that submit annual reports, values are interpolated for late 1981 - early 1982 by averaging mid-1981 and mid-1982 data.



Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Cities Service Gas Company

Cities Service Gas Company purchased approximately 395 Bcf of gas in 1981 (4 percent less than in 1980) at an average cost of $2.08 per Mcf (44 percent over 1981). Cities Service is a land-locked pipeline system whose primary natural gas supply source is contracted reserves in the Hugoton-Anadarko Area (approximately 60 percent of total purchases). Approximately 25 percent of its total supply is purchased from three interstate pipeline companies (Transwestern Pipeline Company, Ringwood Gathering, and Arkansas Louisiana Gas Company); and the remainder comes from production in Oklahoma, the Permian Basin, Wyoming, and South Kansas.

In 1981, Cities Service served 426 natural gas distributors or municipalities and 446 direct sale customers in Texas, Oklahoma, Colorado, Kansas, Missouri, Nebraska, and Wyoming. Its largest markets were located in Kansas and Missouri. Seven distributor customers (The Gas Service Company, Union Gas System, Inc., City of Springfield, Missouri, Missouri Public Service Company, Kansas Power and Light Company, Kansas Public Service Company, and Peoples Natural Gas Company) accounted for approximately 65 percent of its total demand.

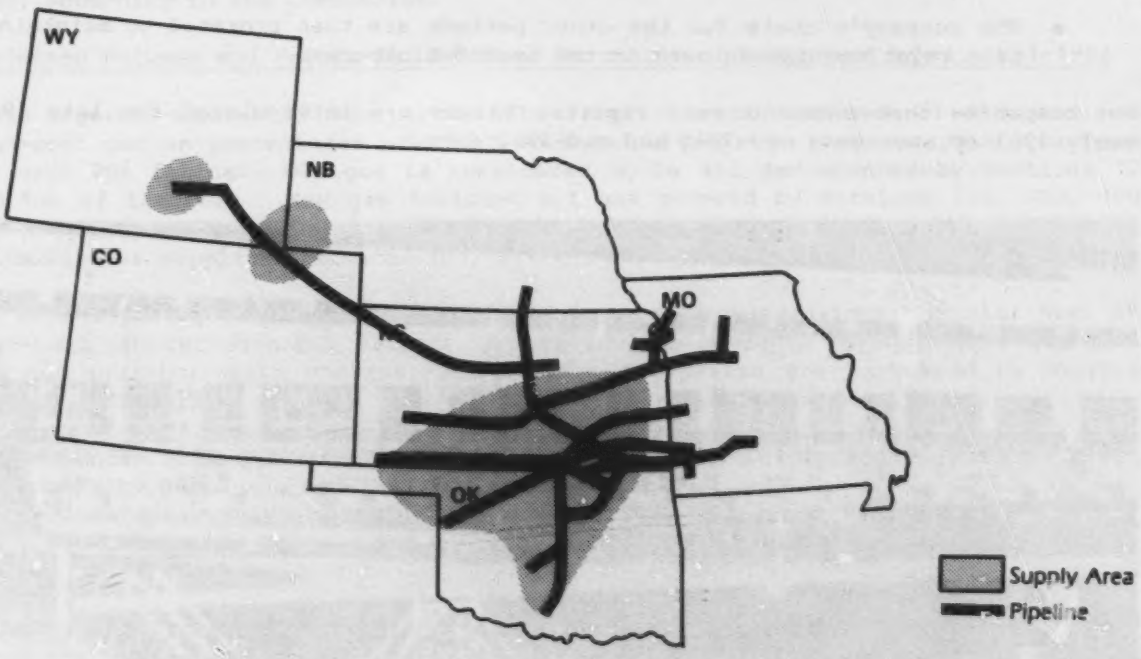


Figure B1. Cities Service Gas Company Pipeline System Diagram

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B1. Pipeline Supplies and Purchase Prices for Cities Service Gas Company, 1977-1981
(Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Category	Year				
	1977	1978	1979	1980	1981
Supply Volumes					
Producer Contracts	356	367	357	311	293
Imports	0	0	0	0	0
Owned Production	0	0	0	0	0
Other Purchases	106	117	157	196	102
Total Supply	452	474	454	507	395
Average Prices					
Producer Contracts	0.51	0.59	0.83	1.28	1.90
Other Purchases[a]	1.06	1.20	1.61	1.95	2.61
Total Average Price	0.63	0.71	0.99	1.44	2.08
Domestic Reserves					
Company Owned	0	0	0	0	0
Producer Contract	4,625	4,476	4,712	4,856	4,858
Total Reserves	4,625	4,476	4,712	4,856	4,858
Reserve/Production Ratio[b]	12.9	12.1	13.1	15.6	16.5

[a]Including imports.

[b]Only company-owned and producer-contracted production and reserves are used in calculating the reserve/production ratio; imports and pipeline purchase/contract volumes are not included.

Note: See introduction to Appendix B for explanation of terms used in this table.

Source: Federal Energy Regulatory Commission Forms 2 and 15.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B2. PGA Projected Volumes and Prices of Natural Gas Wellhead Purchases for Cities Service Gas Company, 1981-1982 (Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Type of Gas[b]	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
	Volume	Average Price	Volume	Average Price	Volume	Average Price
Old Gas	203	0.62	167	0.67	119	0.68
Vintage Through 1972	191	0.57	149	0.60	105	0.63
Vintage After 1972	15	1.27	15	1.28	11	1.17
Vintage Unknown	1	1.25	3	1.24	3	1.00
New Gas	129	2.99	121	3.34	102	3.44
NGPA 102	22	2.94	26	3.03	32	3.07
NGPA 103	39	2.53	35	2.69	24	2.59
NGPA 108	64	3.27	60	3.85	46	4.13
NGPA 109	4	1.43	--	--	--	--
High-Cost Gas	7	3.34	15	5.43	15	6.01
Miscellaneous	--	--	--	--	--	--
Total Projected Purchases[c]	344	1.54	303	1.97	236	2.21

[a]Effective dates for the company's submissions are as follows: mid-1981, May-October 1981; late 1981 - early 1982, November 1981 - April 1982; mid-1982, May-October 1982. Volumes are annual rates.

[b]Types of gas by NGPA Sections are as follows: old gas, Sections 104 and 106; new gas, Sections 102, 103, 108, and 109; high-cost gas, Section 107; miscellaneous, Sections 105, 311, and 312.

[c]Totals may not sum due to independent rounding.

--, No data reported.

Note: All prices are in constant January 1982 dollars per Mcf.

Source: Federal Energy Regulatory Commission Purchased Gas Adjustment (PGA) Filing.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

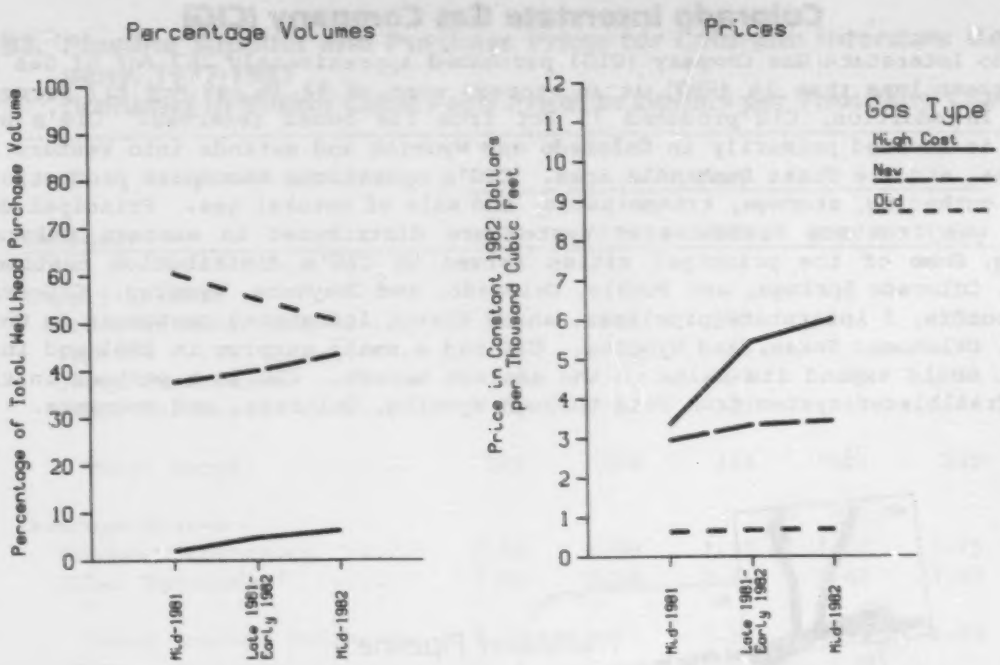


Figure B2. Projected Volumes and Prices of Natural Gas Wellhead Purchases of Major Gas Types, 1981-1982 for Cities Service Gas Company

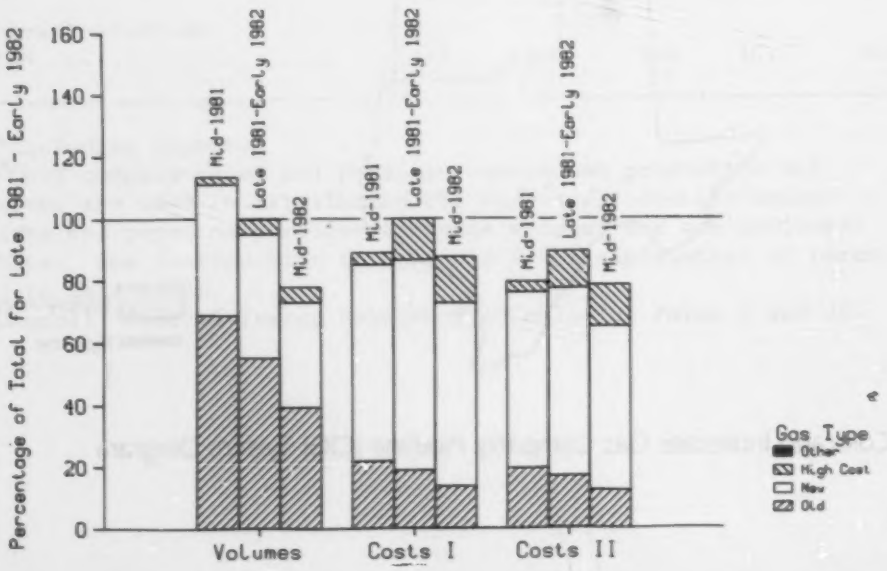


Figure B3. Projected Changes in Volumes and Costs of Wellhead Purchases of Major Gas Types, 1981-1982 for Cities Service Gas Company

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Colorado Interstate Gas Company (CIG)

Colorado Interstate Gas Company (CIG) purchased approximately 267 Bcf of Gas in 1981 (13 percent less than in 1980) at an average cost of $2.75 per Mcf (37 percent over 1981). In addition, CIG produced 71 Bcf from its owned reserves. CIG's pipeline system is located primarily in Colorado and Wyoming and extends into western Kansas, Oklahoma, and the Texas Panhandle area. CIG's operations encompass production, purchase, gathering, storage, transmission, and sale of natural gas. Principal deliveries of gas from the transmission system are distributed in eastern Colorado and Wyoming. Some of the principal cities served by CIG's distribution customers are Denver, Colorado Springs, and Pueblo, Colorado, and Cheyenne, Wyoming. CIG serves 37 distributors, 3 interstate pipelines, and 7 direct industrial customers in Colorado, Kansas, Oklahoma, Texas, and Wyoming. CIG had a small surplus in 1981 and indicated that it would expand its sales to the eastern market. CIG is a partner in the proposed Trailblazer system from Utah through Wyoming, Colorado, and Nebraska.

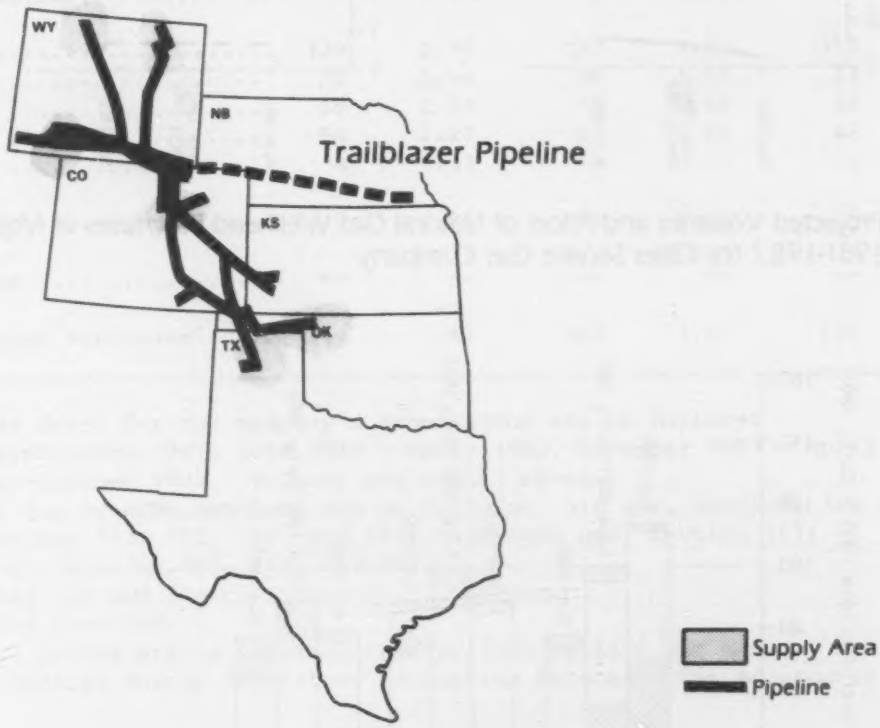


Figure B4. Colorado Interstate Gas Company Pipeline (CIG) System Diagram

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B3. Pipeline Supplies and Purchase Prices for Colorado Interstate Gas Company, 1977-1981
(Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Category	Year				
	1977	1978	1979	1980	1981
Supply Volumes					
Producer Contracts	338	345	295	264	224
Imports	0	0	0	0	0
Owned Production	0	0	99	91	70
Other Purchases	55	51	49	45	44
Total Supply	393	396	443	400	338
Average Prices					
Producer Contracts	0.56	0.76	1.35	1.91	2.76
Other Purchases[a]	1.86	2.04	2.46	3.47	3.86
Total Average Price	0.73	0.92	1.51	2.14	2.95
Domestic Reserves					
Company Owned	0	888	939	860	803
Producer Contract	3,797	3,790	2,797	2,958	2,734
Total Reserves	3,797	4,678	3,736	3,818	3,537
Reserve/Production Ratio[b]	11.2	13.5	9.4	10.7	12.0

[a]Including imports.

[b]Only company-owned and producer-contracted production and reserves are used in calculating the reserve/production ratio; imports and pipeline purchase/contract volumes are not included.

Note: See introduction to Appendix B for explanation of terms used in this table.

Source: Federal Energy Regulatory Commission Forms 2 and 15.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B4. PGA Projected Volumes and Prices of Natural Gas Wellhead Purchases for Colorado Interstate Gas Company, 1981-1982 (Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Type of Gas[b]	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
	Volume	Average Price	Volume	Average Price	Volume	Average Price
Old Gas	143	1.00	NA	NA	134	0.96
Vintage Through 1972	109	0.78	NA	NA	105	0.71
Vintage After 1972	34	1.71	NA	NA	23	1.84
Vintage Unknown	(c)	0.63	NA	NA	6	2.04
New Gas	100	3.05	NA	NA	119	3.09
NGPA 102	45	3.30	NA	NA	59	3.39
NGPA 103	49	2.85	NA	NA	47	2.83
NGPA 108	2	3.43	NA	NA	3	3.24
NGPA 109	4	2.54	NA	NA	10	2.45
High-Cost Gas	31	6.35	NA	NA	35	7.34
Miscellaneous	8	2.57	NA	NA	4	2.20
Total Projected Purchases[d]	281	2.36	NA	NA	292	2.60

[a]Effective dates for the company's submissions are as follows: mid-1981, November-October 1981; late 1981 - early 1982, none; mid-1982, May-October 1982. Volumes are annual rates.

[b]Types of gas by NGPA Sections are as follows: old gas, Sections 104 and 106; new gas, Sections 102, 103, 108, and 109; high-cost gas, Section 107; miscellaneous, Sections 105, 311, and 312.

[c]Less than 0.5 billion cubic feet.

[d]Totals may not sum due to independent rounding.

--, No data reported.

Note: All prices are in constant January 1982 dollars per Mcf.

Source: Federal Energy Regulatory Commission Purchased Gas Adjustment (PGA) Filing.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

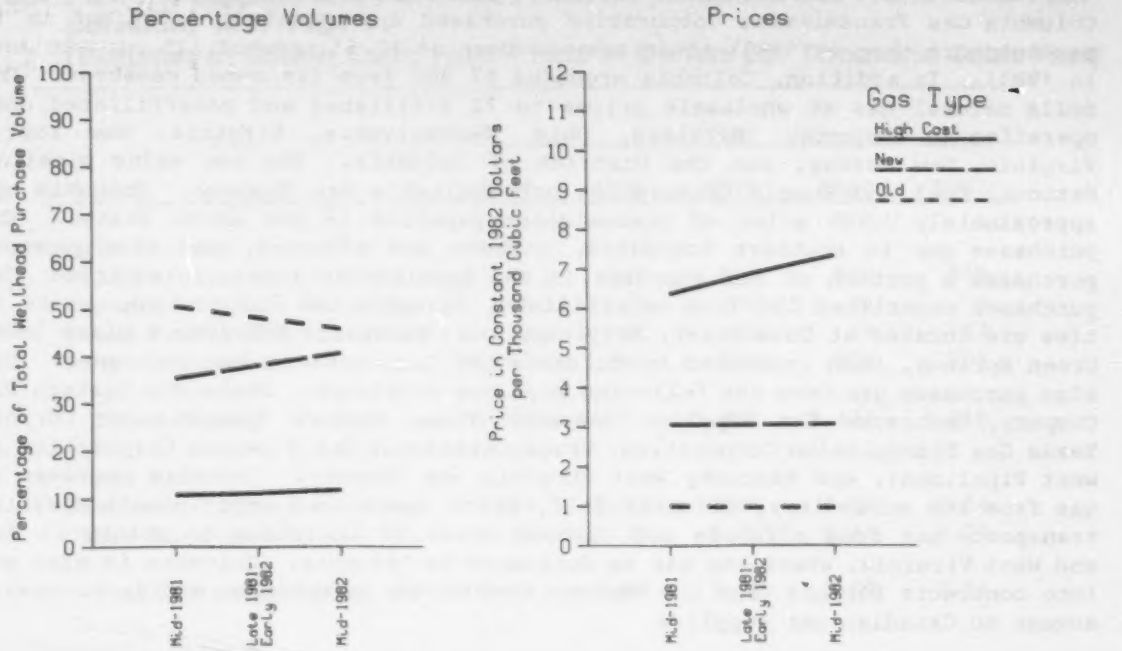


Figure B5. Projected Volumes and Prices of Natural Gas Wellhead Purchases of Major Gas Types, 1981-1982 for Colorado Interstate Gas Company

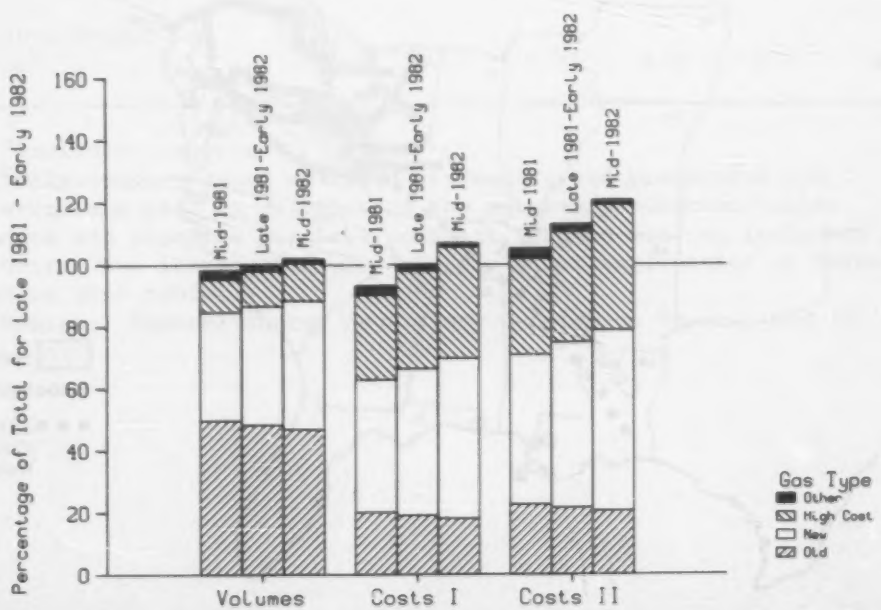


Figure B6. Projected Changes in Volumes and Costs of Wellhead Purchases of Major Gas Types, 1981-1982 for Colorado Interstate Gas Company

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Columbia Gas Transmission Corporation

Columbia Gas Transmission Corporation purchased approximately 1,069 Bcf in 1981 (5 percent more than in 1980) at an average cost of $2.61 per Mcf (25 percent more than in 1980). In addition, Columbia produced 47 Bcf from its owned reserves. Columbia sells natural gas at wholesale prices to 72 affiliated and nonaffiliated companies operating in Kentucky, Maryland, Ohio, Pennsylvania, Virginia, New York, West Virginia, New Jersey, and the District of Columbia. The two major pipelines are National Fuel Gas Supply Corporation and Equitable Gas Company. Columbia operates approximately 9,900 miles of transmission pipeline in the above States. Columbia purchases gas in southern Louisiana, onshore and offshore, and also produces and purchases a portion of its supplies in the Appalachian area. In addition, Columbia purchases regasified LNG from an affiliate, Columbia LNG Corporation, whose facilities are located at Cove Point, Maryland, and transports SNG from a plant located in Green Springs, Ohio (operated by Columbia LNG Corporation) for customers. Columbia also purchases gas from the following pipeline suppliers: Panhandle Eastern Pipeline Company, Tennessee Gas Pipeline Company, Texas Eastern Transmission Corporation, Texas Gas Transmission Corporation, Transcontinental Gas Pipeline Corporation (Southwest Pipelines), and Kentucky West Virginia Gas Company. Columbia receives natural gas from its subsidiary, Columbia Gulf, which operates a major pipeline system that transports gas from offshore and onshore areas of Louisiana to points in Kentucky and West Virginia, where the gas is delivered to Columbia. Columbia is also entering into contracts for gas from the Western Overthrust in Wyoming, and is increasing its access to Canadian gas supplies.

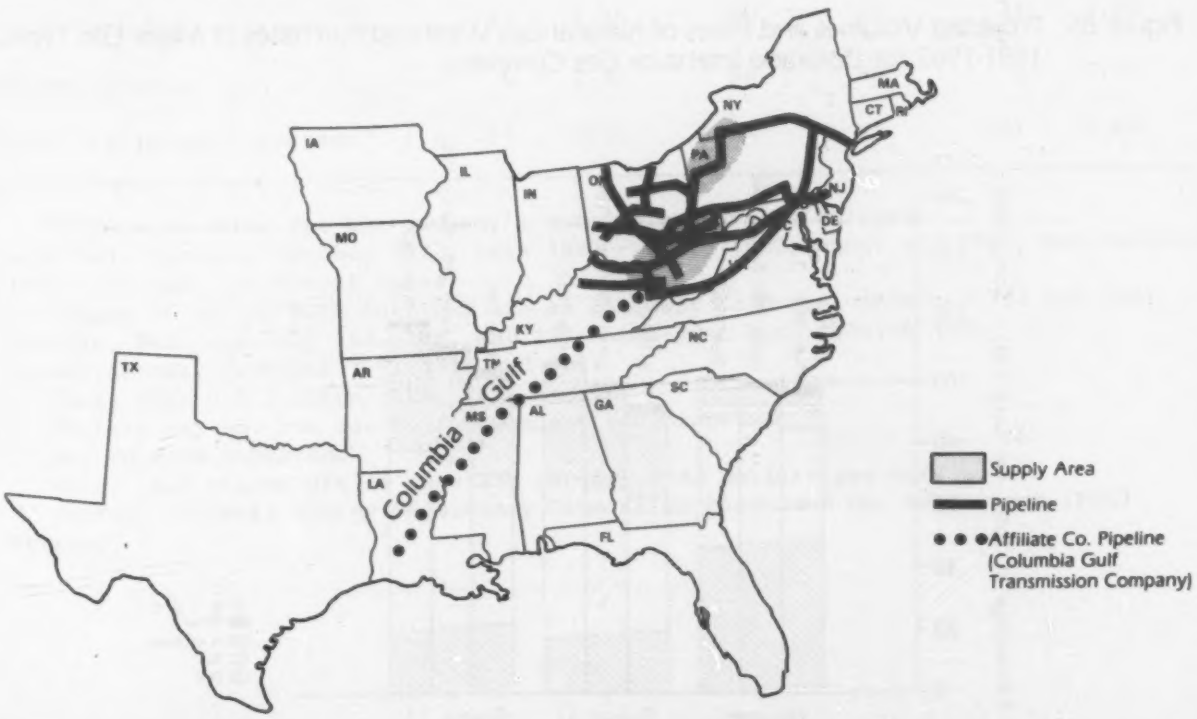


Figure B7. Columbia Gas Transmission Corporation System Diagram

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B5. Pipeline Supplies and Purchase Prices for Columbia Gas Transmission Corporation, 1977-1981
(Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Category	Year				
	1977	1978	1979	1980	1981
Supply Volumes					
Producer Contracts	528	540	523	512	615
Imports	28	27	72	25	0
Owned Production	49	48	46	41	47
Other Purchases	461	482	521	533	504
Total Supply	1,066	1,097	1,162	1,111	1,166
Average Prices					
Producer Contracts	1.04	1.07	1.35	1.83	2.54
Other Purchases[a]	1.19	1.38	1.79	2.31	2.70
Total Average Price	1.11	1.22	1.58	2.08	2.61
Domestic Reserves					
Company Owned	428	432	429	386	398
Producer Contract	3,031	3,172	3,123	3,362	3,932
Total Reserves	3,459	3,604	3,552	3,748	3,330
Reserve/Production Ratio[b]	5.9	6.1	6.2	6.7	5.0

[a]Including imports.

[b]Only company-owned and producer-contracted production and reserves are used in calculating the reserve/production ratio; imports and pipeline purchase/contract volumes are not included.

Note: See introduction to Appendix B for explanation of terms used in this table.

Source: Federal Energy Regulatory Commission Forms 2 and 15.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B6. PGA Projected Volumes and Prices of Natural Gas Wellhead Purchases for Columbia Gas Transmission Corporation, 1981-1982 (Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
Type of Gas[b]	Volume	Average Price	Volume	Average Price	Volume	Average Price
Old Gas	274	1.47	257	1.38	262	1.42
Vintage Through 1972	107	0.85	113	0.79	103	0.75
Vintage After 1972	164	1.86	143	1.85	155	1.86
Vintage Unknown	3	1.73	1	1.12	4	1.71
New Gas	310	2.97	351	2.91	303	2.95
NGPA 102	230	3.02	248	3.01	195	3.09
NGPA 103	71	2.77	91	2.59	96	2.63
NGPA 108	7	3.54	11	3.25	11	3.35
NGPA 109	2	2.40	1	2.16	1	2.18
High-Cost Gas	4	6.84	62	7.81	61	7.63
Miscellaneous	9	1.54	8	1.46	7	1.43
Total Projected Purchases[c]	597	2.29	678	2.76	633	2.75

[a]Effective dates for the company's submissions are as follows: mid-1981, March-August 1981; late 1981 - early 1982, September 1981 - February 1982; mid-1982, March-August 1982. Volumes are annual rates.

[b]Types of gas by NGPA Sections are as follows: old gas, Sections 104 and 106; new gas, Sections 102, 103, 108, and 109; high-cost gas, Section 107; miscellaneous, Sections 105, 311, and 312.

[c]Totals may not sum due to independent rounding.

--, No data reported.

Note: All prices are in constant January 1982 dollars per Mcf.

Source: Federal Energy Regulatory Commission Purchased Gas Adjustment (PGA) Filing.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

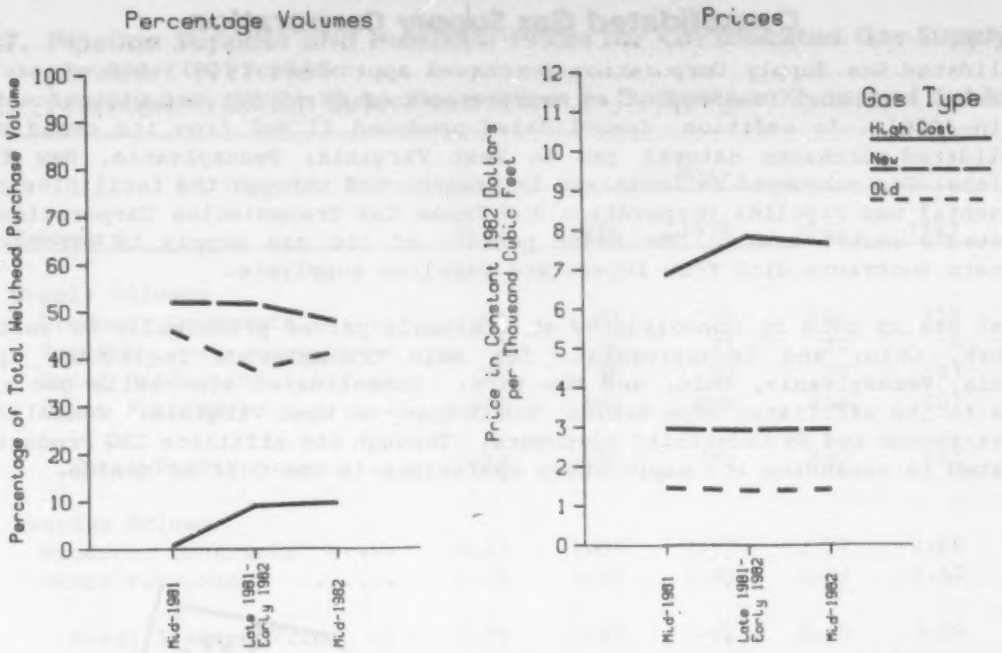


Figure B8. Projected Volumes and Prices of Natural Gas Wellhead Purchases of Major Gas Types, 1981-1982 for Columbia Gas Transmission Corporation

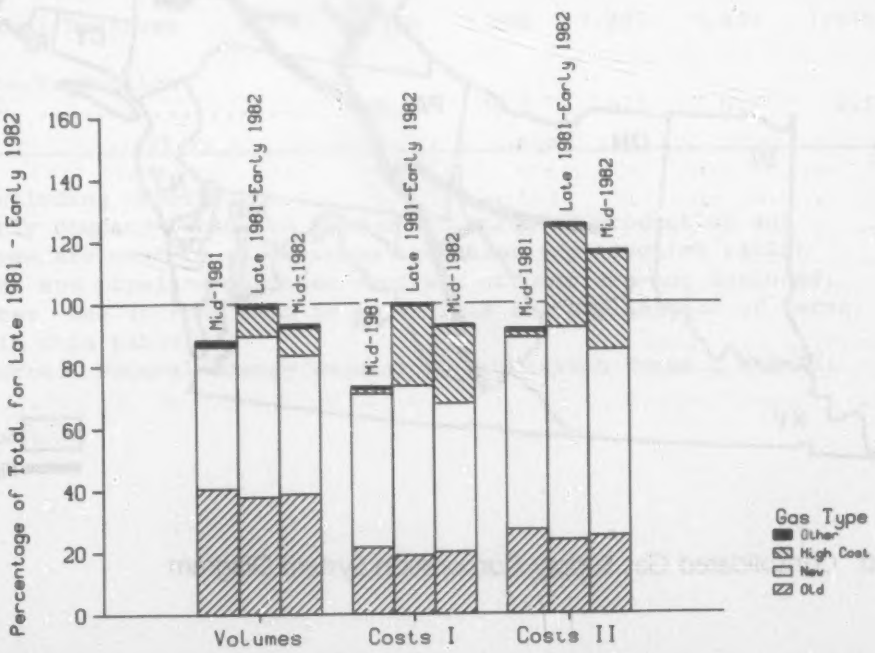


Figure B9. Projected Changes in Volumes and Costs of Wellhead Purchases of Major Gas Types, 1981-1982 for Columbia Gas Transmission Corporation

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Consolidated Gas Supply Corporation

Consolidated Gas Supply Corporation purchased approximately 633 Bcf of gas in 1981 (4 percent more than in 1980) at an average cost of $2.59 per Mcf (15 percent greater than in 1980). In addition, Consolidated produced 31 Bcf from its owned reserves. Consolidated purchases natural gas in West Virginia, Pennsylvania, New York, and Louisiana. Gas purchased in Louisiana is transported through the facilities of Transcontinental Gas Pipeline Corporation and Texas Gas Transmission Corporation to Consolidated's market areas. The major portion of its gas supply is purchased under long-term contracts with four interstate pipeline suppliers.

Natural gas is sold by Consolidated at wholesale prices principally to customers in New York, Ohio, and Pennsylvania. Its main transmission facilities span West Virginia, Pennsylvania, Ohio, and New York. Consolidated also sells gas at retail prices to its affiliate, Hope Natural Gas Company in West Virginia. Consolidated has 40 distributor and 28 industrial customers. Through its affiliate CNG Producing, Consolidated is expanding its exploratory operations in the Gulf of Mexico.

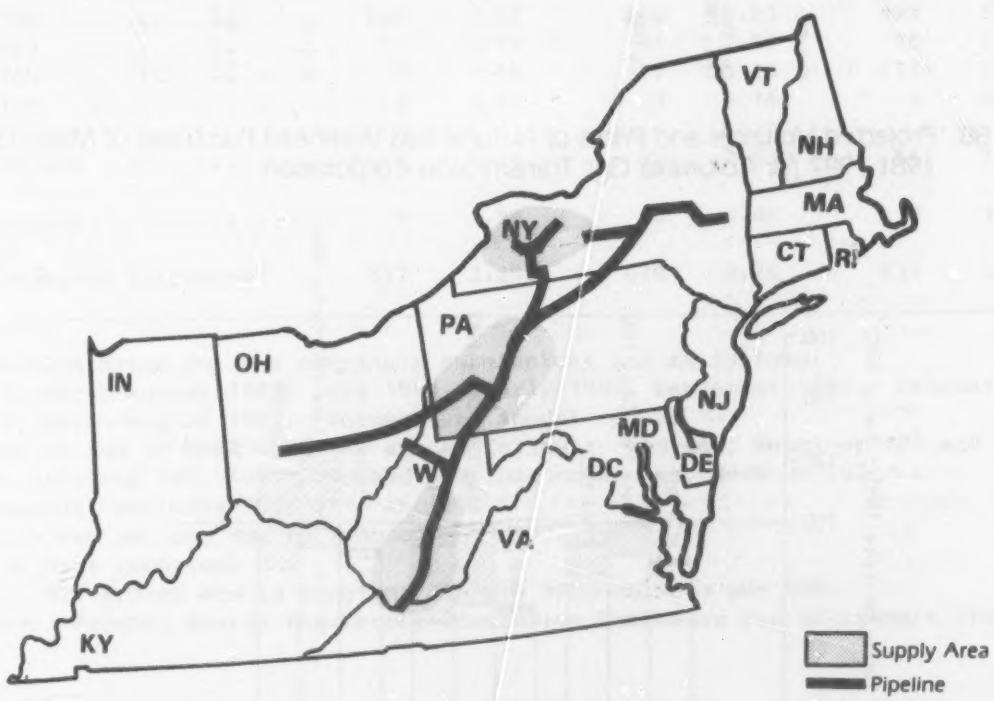


Figure B10. Consolidated Gas Supply Corporation System Diagram

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B7. Pipeline Supplies and Purchase Prices for Consolidated Gas Supply Corporation, 1977-1981
(Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Category	Year				
	1977	1978	1979	1980	1981
Supply Volumes					
Producer Contracts	73	91	115	120	127
Imports	1	18	71	22	0
Owned Production	38	36	32	29	31
Other Purchases	539	509	484	466	507
Total Supply	651	654	702	637	665
Average Prices					
Producer Contracts	0.87	1.81	1.79	2.27	2.66
Other Purchases[a]	1.23	1.37	1.82	2.24	2.57
Total Average Price	1.18	1.35	1.82	2.25	2.59
Domestic Reserves					
Company Owned	479	474	450	420	400
Producer Contract	637	864	857	1,008	1,018
Total Reserves	1,116	1,338	1,307	1,428	1,418
Reserve/Production Ratio[b]	10.0	10.5	8.8	9.5	9.5

[a]Including imports.

[b]Only company-owned and producer-contracted production and reserves are used in calculating the reserve/production ratio; imports and pipeline purchase/contract volumes are not included.

Note: See introduction to Appendix B for explanation of terms used in this table.

Source: Federal Energy Regulatory Commission Forms 2 and 15.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B8. PGA Projected Volumes and Prices of Natural Gas Wellhead Purchases for Consolidated Gas Supply Corporation, 1981-1982 (Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
Type of Gas[b]	Volume	Average Price	Volume	Average Price	Volume	Average Price
Old Gas	34	1.50	29	1.49	28	1.53
Vintage Through 1972	11	1.06	10	1.07	10	1.02
Vintage After 1972	8	1.74	6	1.71	5	1.78
Vintage Unknown	15	1.74	13	1.76	13	1.86
New Gas	70	2.89	73	2.93	74	3.00
NGPA 102	19	2.93	21	2.99	19	3.08
NGPA 103	22	2.56	22	2.57	25	2.61
NGPA 108	28	3.13	28	3.20	29	3.31
NGPA 109	1	2.13	2	2.13	1	2.16
High-Cost Gas	--	--	--	--	--	--
Miscellaneous	--	--	--	--	--	--
Total Projected Purchases[c]	104	2.42	102	2.51	102	2.58

[a]Effective dates for the company's submissions are as follows: mid-1981, March-August 1981; late 1981 - early 1982, September 1981 - February 1982; mid-1982, March-August 1982. Volumes are annual rates.

[b]Types of gas by NGPA Sections are as follows: old gas, Sections 104 and 106; new gas, Sections 102, 103, 108, and 109; high-cost gas, Section 107; miscellaneous, Sections 105, 311, and 312.

[c]Totals may not sum due to independent rounding.

--, No data reported.

Note: All prices are in constant January 1982 dollars per Mcf.

Source: Federal Energy Regulatory Commission Purchased Gas Adjustment (PGA) Filing.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

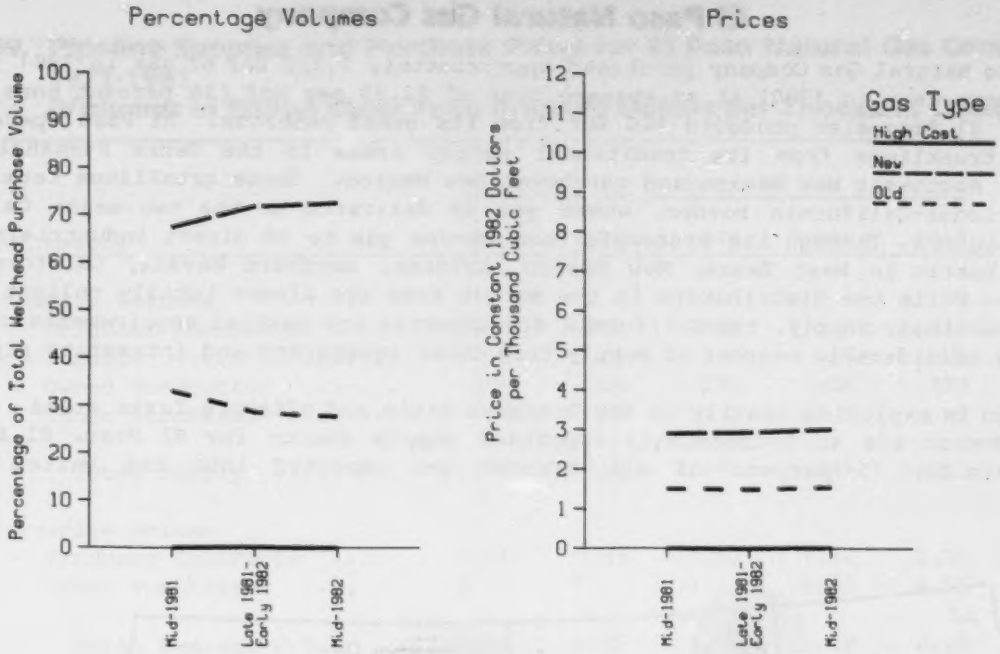


Figure B11. Projected Volumes and Prices of Natural Gas Wellhead Purchases of Major Gas Types, 1981-1982 for Consolidated Gas Supply Corporation

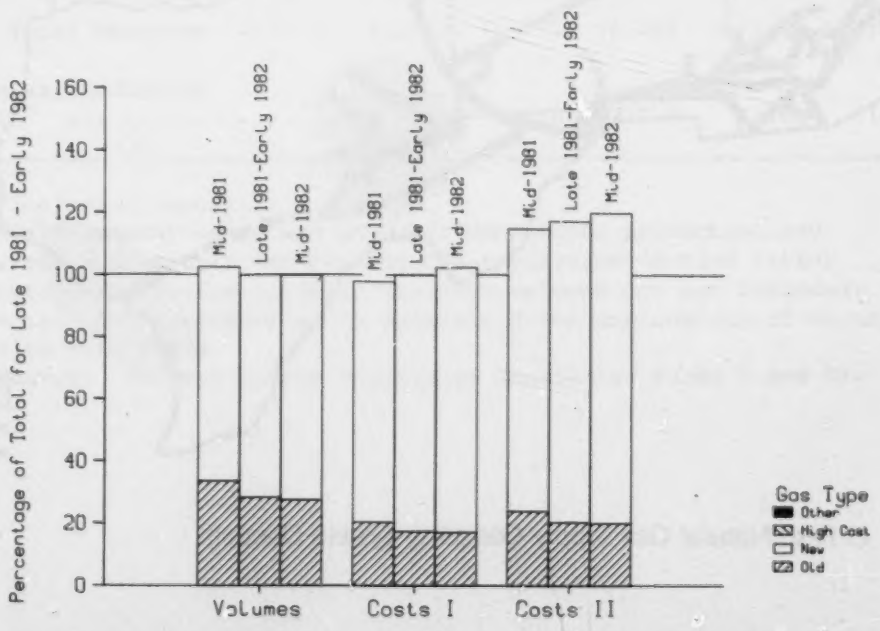


Figure B12. Projected Changes in Volumes and Costs of Wellhead Purchases of Major Gas Types, 1981-1982 for Consolidated Gas Supply Corporation

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

El Paso Natural Gas Company

El Paso Natural Gas Company purchased approximately 1,132 Bcf of gas in 1981 (10 percent more than in 1980) at an average cost of $2.29 per Mcf (36 percent more than in 1980). El Paso also produced 266 Bcf from its owned reserves. El Paso operates two major trunklines from its traditional supply areas in the Texas Panhandle, West Texas, southeast New Mexico and northwest New Mexico. These trunklines terminate at the Arizona-California border, where gas is delivered to the two major California distributors. Through its system El Paso serves gas to 30 direct industrials and 70 distributors in West Texas, New Mexico, Arizona, southern Nevada, California, and Mexico. While the distributors in the market area are almost totally reliant upon El Paso for their supply, the California distributors are partial requirements customers having considerable sources of supply from other interstate and intrastate pipelines.

El Paso is exploring heavily in the Anadarko Basin and offshore Texas areas. Imports from Mexico are an increasingly important supply source for El Paso. El Paso now accounts for 15 percent of all Mexican gas imported into the United States.

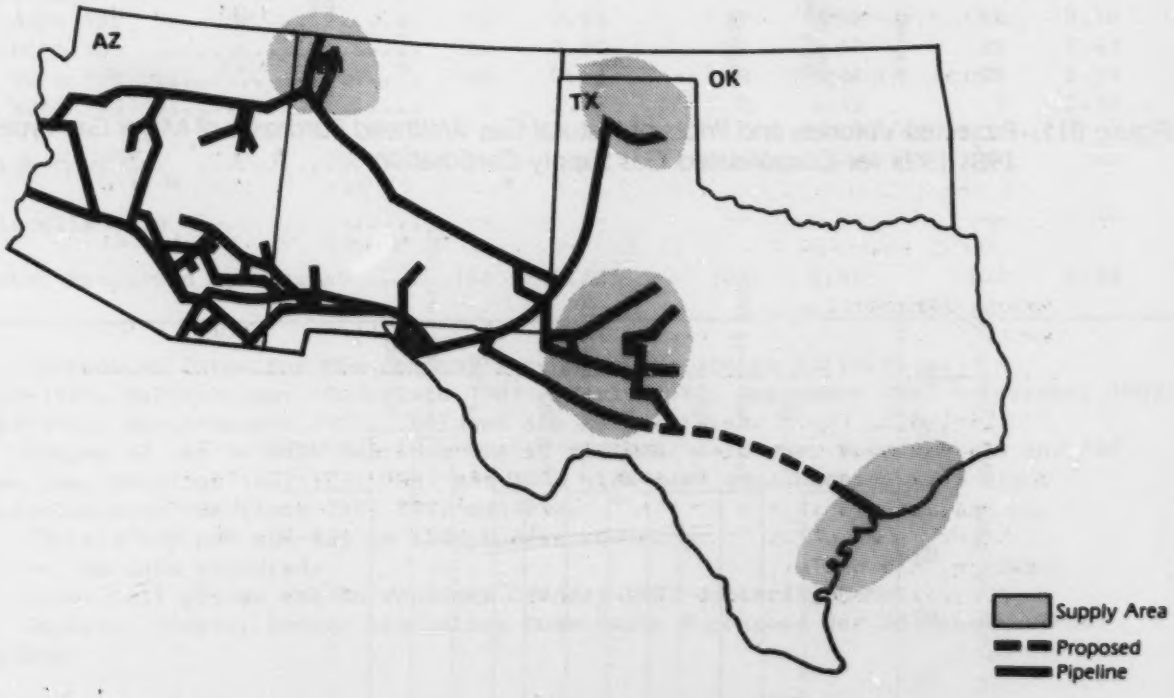


Figure B13. El Paso Natural Gas Supply Company System Diagram

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B9. Pipeline Supplies and Purchase Prices for El Paso Natural Gas Company, 1977-1981
(Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Category	Year				
	1977	1978	1979	1980	1981
Supply Volumes					
Producer Contracts	975	948	995	1,010	1,113
Imports	0	0	0	15	20
Owned Production	236	248	275	268	250
Other Purchases	0	0	0	0	0
Total Supply	1,211	1,196	1,270	1,293	1,383
Average Prices					
Producer Contracts	0.66	0.85	1.32	1.64	2.25
Other Purchases[a]	0	0	0	4.41	4.56
Total Average Price	0.66	0.85	1.32	1.68	2.29
Domestic Reserves					
Company Owned	4,914	5,524	5,942	5,782	5,528
Producer Contract	8,243	8,693	10,547	10,359	10,816
Total Reserves	13,157	14,217	16,489	16,141	16,344
Reserve/Production Ratio[b]	10.8	11.8	12.9	12.6	11.9

[a]Including imports.

[b]Only company-owned and producer-contracted production and reserves are used in calculating the reserve/production ratio; imports and pipeline purchase/contract volumes are not included.

Note: See introduction to Appendix B for explanation of terms used in this table.

Source: Federal Energy Regulatory Commission Forms 2 and 15.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B10. PGA Projected Volumes and Prices of Natural Gas Wellhead Purchases for El Paso Natural Gas Company, 1981-1982 (Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
Type of Gas[b]	Volume	Average Price	Volume	Average Price	Volume	Average Price
Old Gas	600	1.17	523	1.28	534	1.20
Vintage Through 1972	([c])	([c])	([c])	([c])	460	1.08
Vintage After 1972	([c])	([c])	([c])	([c])	73	1.94
Vintage Unknown	600	1.17	523	1.28	1	1.71
	378	3.05	443	3.07	495	3.20
New Gas						
NGPA 102	91	3.35	131	3.46	177	3.45
NGPA 103	220	2.97	231	2.99	254	3.08
NGPA 108	30	3.97	26	3.47	20	3.98
NGPA 109	40	2.43	56	2.36	44	2.53
High-Cost Gas	34	4.54	44	6.12	91	6.90
Miscellaneous	--	--	3	3.29	12	3.31
Total Projected Purchases[d]	1015	2.00	1013	2.28	1132	2.55

[a]Effective dates for the company's submissions are as follows: mid-1981, April-September 1981; late 1981 - early 1982, October 1981 - March 1982; mid-1982, April-September 1982. Volumes are annual rates.

[b]Types of gas by NGPA Sections are as follows: old gas, Sections 104 and 106; new gas, Sections 102, 103, 108, and 109; high-cost gas, Section 107; miscellaneous, Sections 105, 311, and 312.

[c]Vintage (contract date) unavailable in filed data.

[d]Totals may not sum due to independent rounding.

--, No data reported.

Note: All prices are in constant January 1982 dollars per Mcf.

Source: Federal Energy Regulatory Commission Purchased Gas Adjustment (PGA) Filing.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

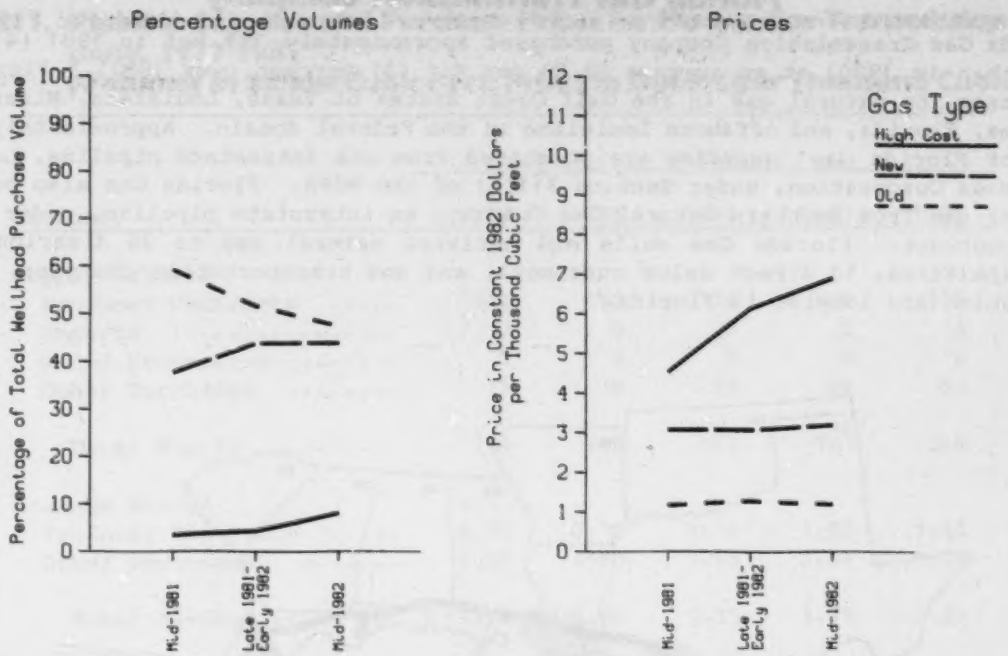


Figure B14. Projected Volumes and Prices of Natural Gas Wellhead Purchases of Major Gas Types, 1981-1982 for El Paso Natural Gas Company

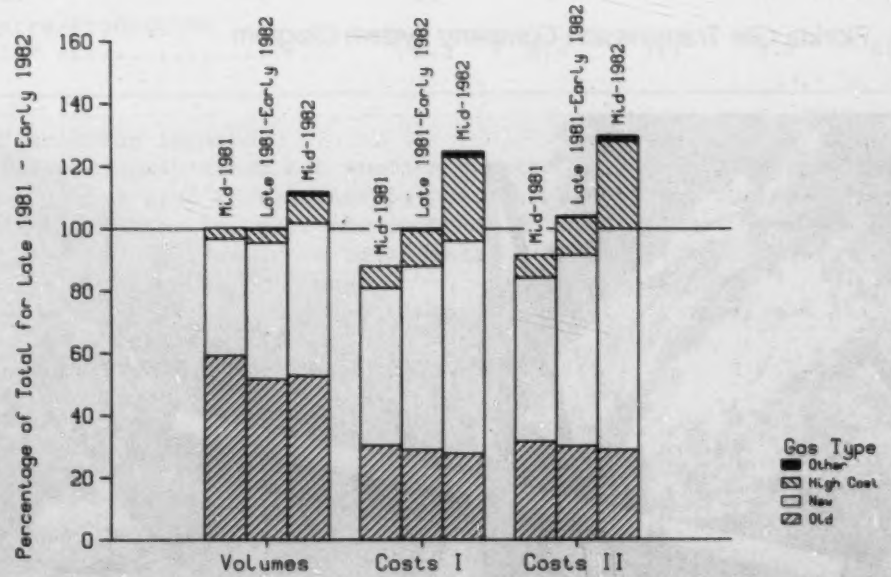


Figure B15. Projected Changes in Volumes and Costs of Wellhead Purchases of Major Gas Types, 1981-1982 for El Paso Natural Gas Company

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Florida Gas Transmission Company

Florida Gas Transmission Company purchased approximately 199 Bcf in 1981 (4 percent more than in 1980) at an average $2.29 per Mcf (31 percent over 1980). Florida Gas purchases its natural gas in the Gulf Coast States of Texas, Louisiana, Mississippi, Alabama, Florida, and offshore Louisiana in the Federal domain. Approximately 5 percent of Florida Gas' supplies are purchased from one intrastate pipeline, Louisiana Resources Corporation, under Section 311(b) of the NGPA. Florida Gas also purchases natural gas from Southern Natural Gas Company, an interstate pipeline, under a long-term contract. Florida Gas sells and delivers natural gas to 35 distributors or municipalities, 58 direct sales customers, and one transportation customer, all but 1 of which are located in Florida.

Figure B16. Florida Gas Transmission Company System Diagram

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B11. Pipeline Supplies and Purchase Prices for Florida Gas Transmission Company, 1977-1981
(Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Category	Year				
	1977	1978	1979	1980	1981
Supply Volumes					
Producer Contracts	102	122	136	149	136
Imports	0	0	0	3	4
Owned Production	0	0	0	0	0
Other Purchases	17	18	37	39	60
Total Supply	119	140	173	191	200
Average Prices					
Producer Contracts	0.70	0.79	1.19	1.55	1.82
Other Purchases[a]	0.96	1.30	1.96	2.43	3.29
Total Average Price	0.74	0.86	1.35	1.75	2.29
Domestic Reserves					
Company Owned	0	0	0	0	0
Producer Contract	633	623	702	587	670
Total Reserves	633	623	702	587	670
Reserve/Production Ratio[b]	6.2	5.1	5.1	3.9	4.9

[a]Including imports.

[b]Only company-owned and producer-contracted production and reserves are used in calculating the reserve/production ratio; imports and pipeline purchase/contract volumes are not included.

Note: See introduction to Appendix B for explanation of terms used in this table.

Source: Federal Energy Regulatory Commission Forms 2 and 15.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B12. PGA Projected Volumes and Prices of Natural Gas Wellhead Purchases for Florida Gas Transmission Company, 1981-1982 (Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Type of Gas[b]	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
	Volume	Average Price	Volume	Average Price	Volume	Average Price
Old Gas	88	1.05	86	1.02	82	1.12
Vintage Through 1972	50	0.47	42	0.45	44	0.43
Vintage After 1972	38	1.79	40	1.69	37	1.91
Vintage Unknown	(c)	0.56	4	0.30	1	2.03
New Gas	36	2.93	37	2.97	27	3.10
NGPA 102	26	3.07	27	3.11	19	3.28
NGPA 103	4	2.82	6	2.75	5	2.81
NGPA 108	(c)	3.50	(c)	3.48	(c)	3.61
NGPA 109	5	2.34	4	2.31	3	2.34
High-Cost Gas	13	4.79	9	5.84	9	5.82
Miscellaneous	--	--	--	--	--	--
Total Projected Purchases[d]	137	1.91	132	1.88	118	1.92

[a]Effective dates for the company's submissions are as follows: mid-1981, April-September 1981; late 1981 - early 1982, October 1981 - March 1982; mid-1982, April-September 1982. Volumes are annual rates.

[b]Types of gas by NGPA Sections are as follows: old gas, Sections 104 and 106; new gas, Sections 102, 103, 108, and 109; high-cost gas, Section 107; miscellaneous, Sections 105, 311, and 312.

[c]Less than 0.5 billion cubic feet.

[d]Totals may not sum due to independent rounding.

--, No data reported.

Note: All prices are in constant January 1982 dollars per Mcf.

Source: Federal Energy Regulatory Commission Purchased Gas Adjustment (PGA) Filing.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

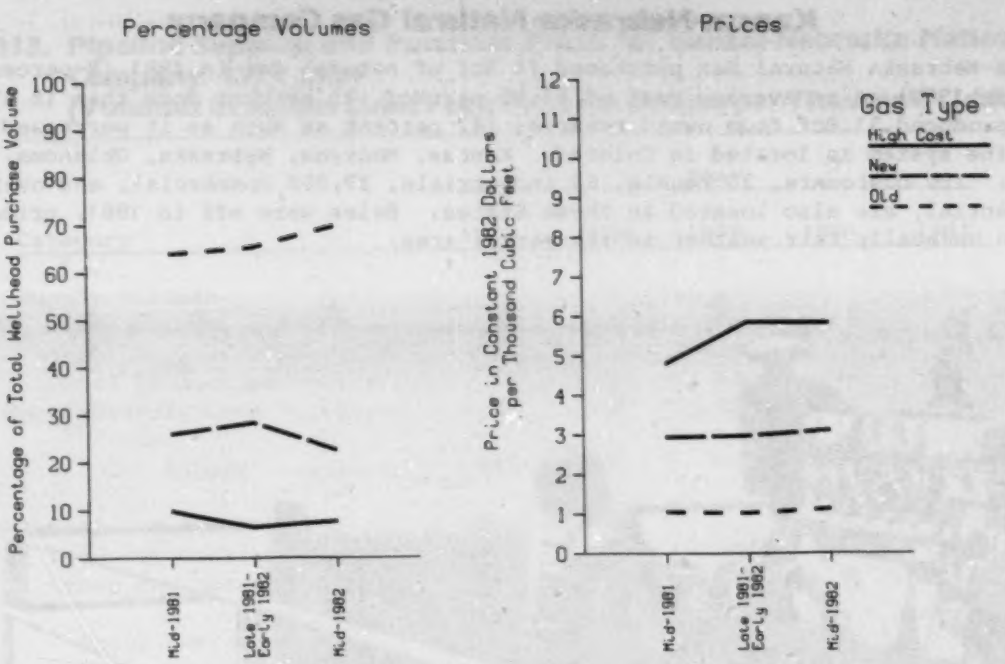


Figure B17. Projected Volumes and Prices of Natural Gas Wellhead Purchases of Major Gas Types, 1981-1982 for Florida Gas Transmission Company

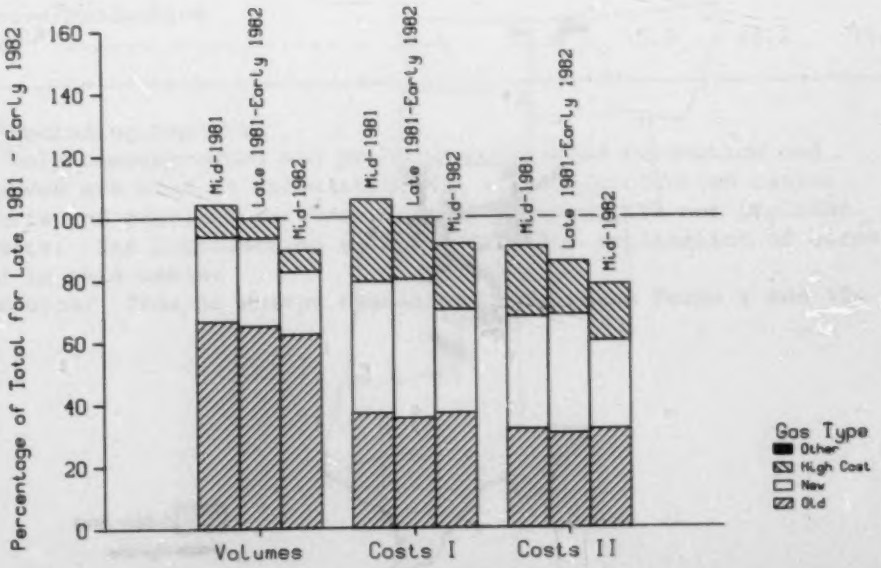


Figure B18. Projected Changes in Volumes and Costs of Wellhead Purchases of Major Gas Types, 1981-1982 for Florida Gas Transmission Company

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Kansas-Nebraska Natural Gas Company

Kansas-Nebraska Natural Gas purchased 76 Bcf of natural gas in 1981 (8 percent less than in 1980) at an average cost of $1.89 per Mcf (35 percent more than in 1980). It also produced 31 Bcf from owned reserves (42 percent as much as it purchased). The pipeline system is located in Colorado, Kansas, Montana, Nebraska, Oklahoma, and Texas. Its customers, 20 resale, 65 industrials, 37,000 commercial, and over 124,000 residential, are also located in these States. Sales were off in 1981, primarily due to unusually fair weather in its market area.

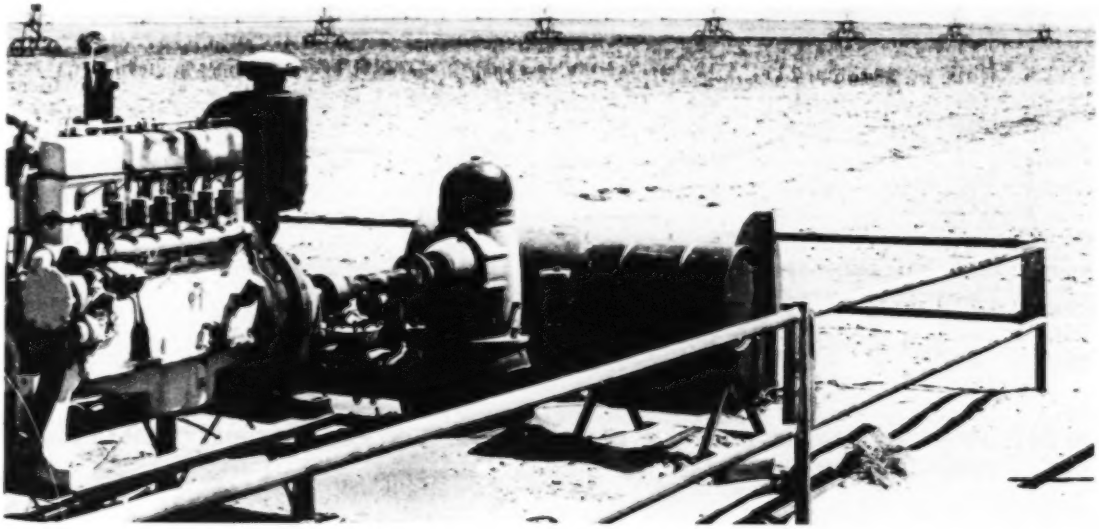


Figure B19. Kansas-Nebraska Natural Gas Company System Diagram

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B13. Pipeline Supplies and Purchase Prices for Kansas-Nebraska Natural Gas Company, 1977-1981
(Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Category	Year				
	1977	1978	1979	1980	1981
Supply Volumes					
Producer Contracts	72	72	73	69	61
Imports	0	0	0	3	4
Owned Production	46	51	43	39	33
Other Purchases	27	26	25	14	16
Total Supply	145	149	141	125	100
Average Prices					
Producer Contracts	0.54	0.65	.99	1.25	1.67
Other Purchases[a]	1.19	1.50	1.98	2.15	2.73
Total Average Price	0.71	0.88	1.25	1.40	1.79
Domestic Reserves					
Company Owned	763	748	722	661	659
Producer Contract	851	906	895	881	813
Total Reserves	1,614	1,654	1,617	1,542	1,472
Reserve/Production Ratio[b]	13.6	13.4	13.9	14.2	15.6

[a]Including imports.

[b]Only company-owned and producer-contracted production and reserves are used in calculating the reserve/production ratio; imports and pipeline purchase/contract volumes are not included.

Note: See introduction to Appendix B for explanation of terms used in this table.

Source: Federal Energy Regulatory Commission Forms 2 and 15.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B14. PGA Projected Volumes and Prices of Natural Gas Wellhead Purchases For Kansas-Nebraska Natural Gas Company, 1981-1982 (Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Type of Gas[b]	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
	Volume	Average Price	Volume	Average Price	Volume	Average Price
Old Gas	57	1.03	NA	NA	40	1.11
Vintage Through 1972	([c])	([c])	NA	NA	24	0.50
Vintage After 1972	([c])	([c])	NA	NA	13	2.00
Vintage Unknown	57	1.03	NA	NA	3	2.19
New Gas	15	2.96	NA	NA	20	3.11
NGPA 102	5	3.24	NA	NA	7	3.47
NGPA 103	8	2.72	NA	NA	10	2.81
NGPA 108	2	3.21	NA	NA	3	3.42
NGPA 109	--	--	NA	NA	1	2.61
High-Cost Gas	4	6.68	NA	NA	3	6.21
Miscellaneous	--	--	NA	NA	--	--
Total Projected Purchases[d]	76	1.69	NA	NA	63	1.98

[a]Effective dates for the company's submissions are as follows: mid-1981, December 1981 - November 1982; late 1981 - early 1982, none; mid-1982, December 1982 - November 1983. Volumes are annual rates.

[b]Types of gas by NGPA Sections are as follows: old gas, Sections 104 and 106; new gas, Sections 102, 103, 108, and 109; high-cost gas, Section 107; miscellaneous, Sections 105, 311, and 312.

[c]Vintage (contract date) not provided in the filing.

[d]Totals may not sum due to independent rounding.

--, No data reported.

Note: All prices are in constant January 1982 dollars per Mcf.

Source: Federal Energy Regulatory Commission Purchased Gas Adjustment (PGA) Filing.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

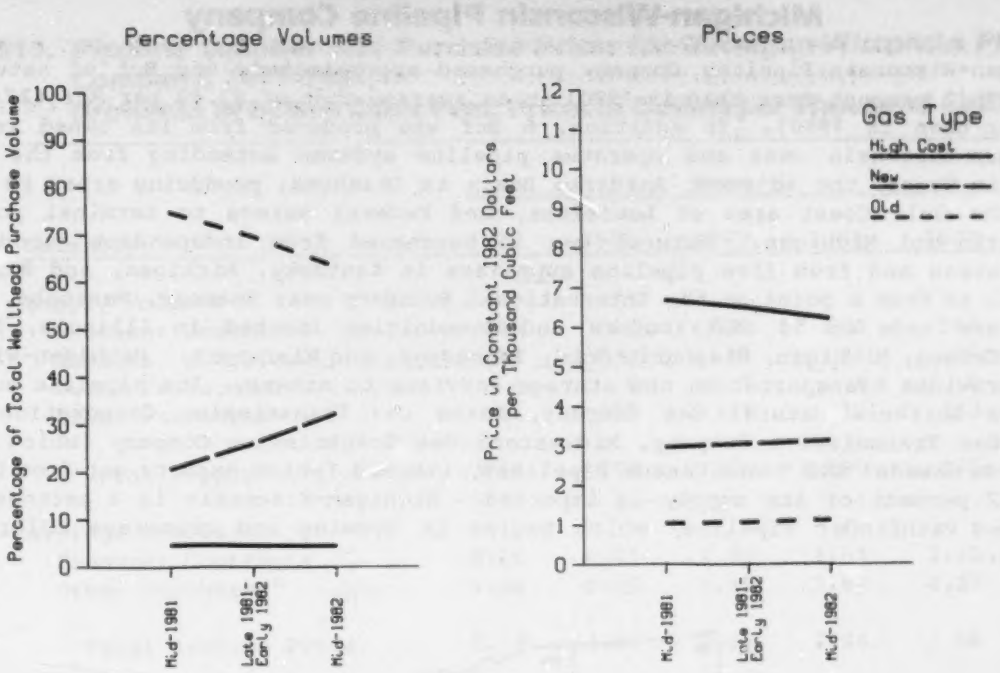


Figure B20. Projected Volumes and Prices of Natural Gas Wellhead Purchases of Major Gas Types, 1981-1982 for Kansas-Nebraska Natural Gas Company

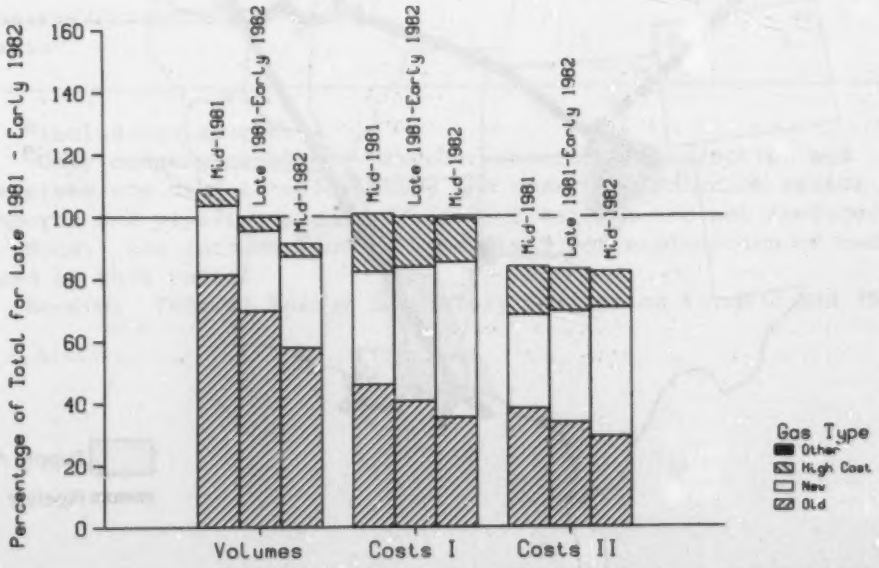


Figure B21. Projected Changes in Volumes and Costs of Wellhead Purchases of Major Gas Types, 1981-1982 for Kansas-Nebraska Natural Gas Company

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Michigan-Wisconsin Pipeline Company

Michigan-Wisconsin Pipeline Company purchased approximately 668 Bcf of natural gas in 1981 (2 percent less than in 1980) at an average cost of $2.60 per Mcf (27 percent greater than in 1980). In addition, 6 Bcf was produced from its owned reserves. Michigan Wisconsin owns and operates pipeline systems extending from the Hugoton Field in Texas, the adjacent Anadarko Basin in Oklahoma, producing areas in Louisiana, the Gulf Coast area of Louisiana, and Federal waters to terminal points in Wisconsin and Michigan. Natural gas is purchased from independent producers in these areas and from five pipeline suppliers in Kentucky, Michigan, and Wisconsin, as well as from a point on the International Boundary near Emerson, Manitoba, Canada. Sales are made to 54 distributors and communities located in Illinois, Indiana, Iowa, Kansas, Michigan, Missouri, Ohio, Tennessee, and Wisconsin. Michigan-Wisconsin also provides transportation and storage services to others. Its pipeline suppliers are the Northern Natural Gas Company, Texas Gas Transmission Corporation, Great Lakes Gas Transmission Company, Midwestern Gas Transmission Company (which imports gas from Canada) and Trans Canada Pipelines, Limited (which exports gas from Canada). About 2 percent of its supply is imported. Michigan-Wisconsin is a partner in the proposed Pathfinder Pipeline, which begins in Wyoming and traverses Colorado and Kansas.

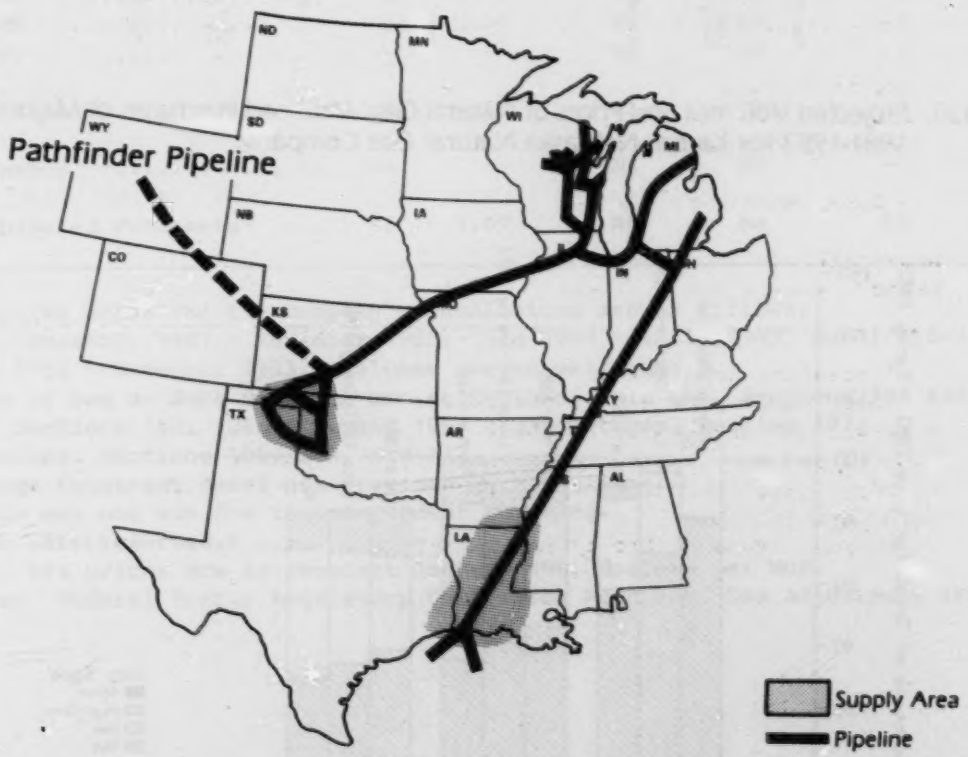


Figure B22. Michigan-Wisconsin Pipeline Company System Diagram

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B15. Pipeline Supplies and Purchase Prices for Michigan-Wisconsin Pipeline Company, 1977-1981
(Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Category	Year				
	1977	1978	1979	1980	1981
Supply Volumes					
Producer Contracts	588	612	638	554	543
Imports	18	18	18	14	13
Owned Production	6	6	7	4	6
Other Purchases	144	136	143	118	113
Total Supply	756	772	806	690	675
Average Prices					
Producer Contracts	0.66	0.81	1.18	1.61	2.20
Other Purchases[a]	1.88	2.06	2.45	3.87	4.33
Total Average Price ..	0.93	1.06	1.43	2.04	2.60
Domestic Reserves					
Company Owned	33	47	77	95	187
Producer Contract	4,317	4,323	3,881	3,661	3,369
Total Reserves	4,350	4,370	3,958	3,756	3,556
Reserve/Production Ratio[b]	7.3	7.0	6.1	6.7	6.4

[a]Including imports.

[b]Only company-owned and producer-contracted production and reserves are used in calculating the reserve/production ratio; imports and pipeline purchase/contract volumes are not included.

Note: See introduction to Appendix B for explanation of terms used in this table.

Source: Federal Energy Regulatory Commission Forms 2 and 15.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B16. PGA Projected Volumes and Prices of Natural Gas Wellhead Purchases for Michigan-Wisconsin Pipeline Company, 1981-1982 (Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
Type of Gas[b]	Volume	Average Price	Volume	Average Price	Volume	Average Price
Old Gas	382	1.39	382	1.36	366	1.30
Vintage Through 1972	18	0.48	19	0.47	19	0.48
Vintage After 1972	279	1.48	([c])	2.17	1	1.55
Vintage Unknown	85	1.31	363	1.40	346	1.35
New Gas	141	3.00	160	2.97	131	3.11
NGPA 102	94	3.04	112	3.04	87	3.19
NGPA 103	46	2.93	41	2.87	40	2.94
NGPA 108	1	3.51	3	2.23	1	3.65
NGPA 109	--	--	2	2.18	2	2.23
High-Cost Gas	17	5.14	41	7.04	48	7.57
Miscellaneous	--	--	2	1.96	2	2.06
Total Projected Purchases[d]	540	1.93	583	2.20	547	2.29

[a]Effective dates for the company's submissions are as follows: mid-1981, May-October 1981; late 1981 - early 1982, November 1981 - April 1982; mid-1982, May-October 1982. Volumes are annual rates.

[b]Types of gas by NGPA Sections are as follows: old gas, Sections 104 and 106; new gas, Sections 102, 103, 108, and 109; high-cost gas, Section 107; miscellaneous, Sections 105, 311, and 312.

[c]Vintage (contract date) not available in filing.

[d]Totals may not sum due to independent rounding.

--, No data reported.

Note: All prices are in constant January 1982 dollars per Mcf.

Source: Federal Energy Regulatory Commission Purchased Gas Adjustment (PGA) Filing.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

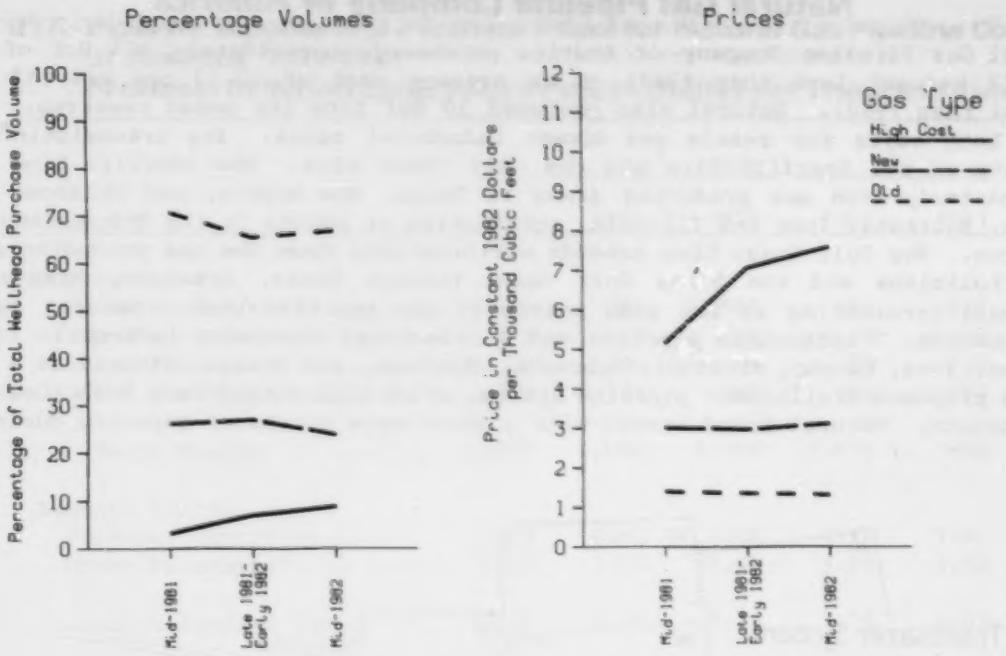


Figure B23. Projected Volumes and Prices of Natural Gas Wellhead Purchases of Major Gas Types, 1981-1982 for Michigan-Wisconsin Pipeline Company

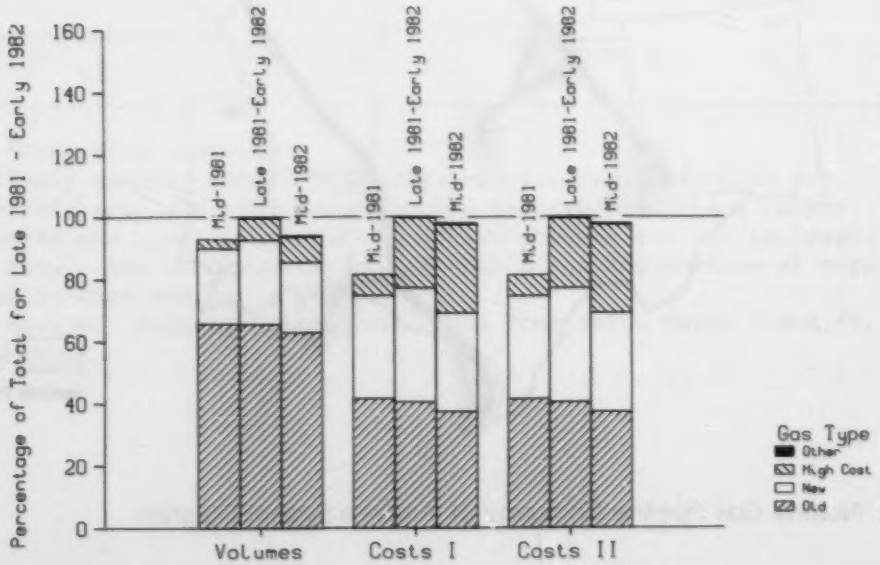


Figure B24. Projected Changes in Volumes and Costs of Wellhead Purchases of Major Gas Types, 1981-1982 for Michigan-Wisconsin Pipeline Company

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Natural Gas Pipeline Company of America

Natural Gas Pipeline Company of America purchased approximately 961 Bcf of gas in 1981 (2 percent less than 1980) at an average cost of $2.07 per Mcf (17 percent greater than 1980). Natural also produced 30 Bcf from its owned reserves. Natural makes both sales for resale and direct industrial sales. Its transmission system consists of the Amarillo Line and the Gulf Coast Line. The Amarillo Line extends northeasterly from gas producing areas of Texas, New Mexico, and Oklahoma through Kansas, Nebraska, Iowa and Illinois, terminating at points in the Chicago metropolitan area. The Gulf Coast Line extends northeasterly from the gas producing areas of South Louisiana and the Texas Gulf Coast through Texas, Arkansas, Missouri, and Illinois, terminating at the same points as the Amarillo Line. Natural serves 50 distributors, 1 interstate pipeline and 4 industrial customers located in Illinois, Indiana, Iowa, Kansas, Missouri, Nebraska, Oklahoma, and Texas. Natural is a partner in the proposed Trailblazer pipeline system, which will extend from Utah (Overthrust) to Nebraska. Natural found itself with a short-term excess of capacity during 1981.

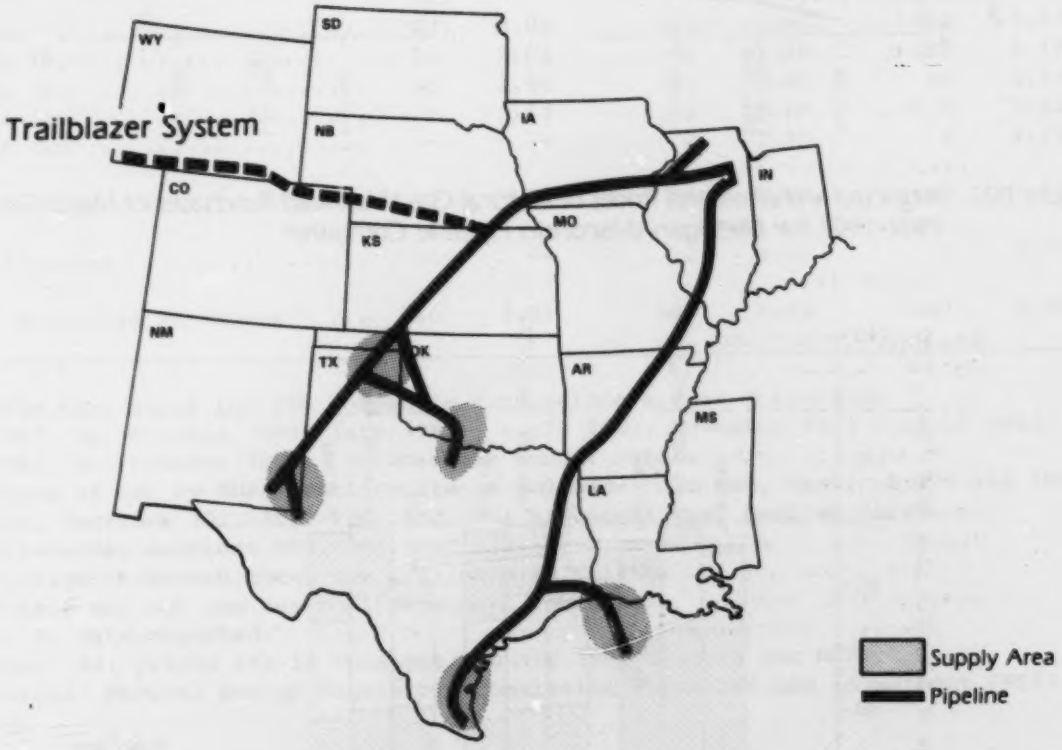


Figure B25. Natural Gas Pipeline Company of America System Diagram

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B17. Pipeline Supplies and Purchase Prices for Natural Gas Pipeline Company of America, 1977-1981
(Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Category	Year				
	1977	1978	1979	1980	1981
Supply Volumes					
Producer Contracts	780	816	880	842	838
Imports	0	0	0	0	0
Owned Production	50	46	44	35	30
Other Purchases	200	181	186	142	124
Total Supply	1,480	1,043	1,110	1,019	992
Average Prices					
Producer Contracts	0.68	0.82	1.18	1.56	1.82
Other Purchases[a]	1.41	1.53	2.02	3.03	3.74
Total Average Price	0.83	0.95	1.32	1.76	2.07
Domestic Reserves					
Company Owned	317	295	573	574	569
Producer Contract	5,690	5,513	6,138	5,757	5,925
Total Reserves	6,007	5,808	6,711	6,331	6,494
Reserve/Production Ratio[b]	7.2	6.7	7.2	7.2	7.4

[a]Including imports.

[b]Only company-owned and producer-contracted production and reserves are used in calculating the reserve/production ratio; imports and pipeline purchase/contract volumes are not included.

Note: See introduction to Appendix B for explanation of terms used in this table.

Source: Federal Energy Regulatory Commission Forms 2 and 15.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B18. PGA Projected Volumes and Prices of Natural Gas Wellhead Purchases for Natural Gas Pipeline Company of America, 1981-1982 (Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Type of Gas[b]	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
	Volume	Average Price	Volume	Average Price	Volume	Average Price
Old Gas	661	1.41	642	1.38	636	1.40
Vintage Through 1972	289	0.90	280	0.88	270	0.87
Vintage After 1972	342	1.91	330	1.86	335	1.89
Vintage Unknown	30	0.58	32	0.58	31	0.59
New Gas	187	3.04	219	3.04	261	3.15
NGPA 102	125	3.16	142	3.19	177	3.30
NGPA 103	52	2.79	66	2.78	75	2.87
NGPA 108	4	3.47	4	3.49	5	3.57
NGPA 109	6	2.40	7	2.36	4	2.40
High-Cost Gas	(c)	4.79	2	3.78	4	4.76
Miscellaneous	--	--	--	--	--	--
Total Projected Purchases[d]	848	1.77	863	1.81	900	1.92

[a]Effective dates for the company's submissions are as follows: mid-1981, March-August 1981; late 1981 - early 1982, September 1981 - February 1982; mid-1982, March-August 1982. Volumes are annual rates.

[b]Types of gas by NGPA Sections are as follows: old gas, Sections 104 and 106; new gas, Sections 102, 103, 108, and 109; high-cost gas, Section 107; miscellaneous, Sections 105, 311, and 312.

[c]Less than 0.5 billion cubic feet.

[d]Totals may not sum due to independent rounding.

--, No data reported.

Note: All prices are in constant January 1982 dollars per Mcf.

Source: Federal Energy Regulatory Commission Purchased Gas Adjustment (PGA) Filing.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

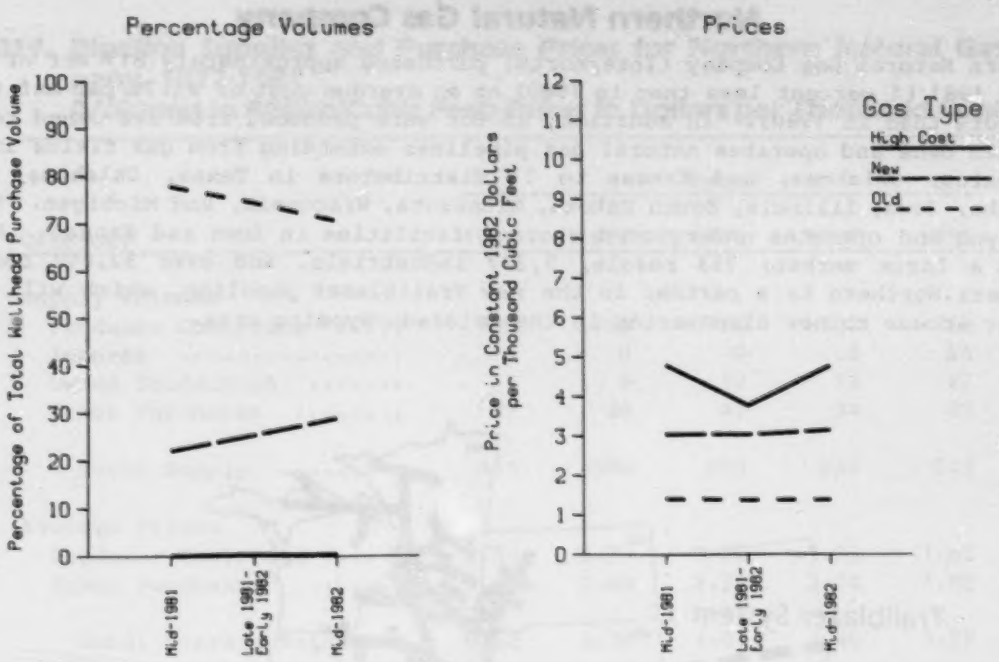


Figure B26. Projected Volumes and Prices of Natural Gas Wellhead Purchases of Major Gas Types, 1981-1982 for Natural Gas Pipeline Company of America

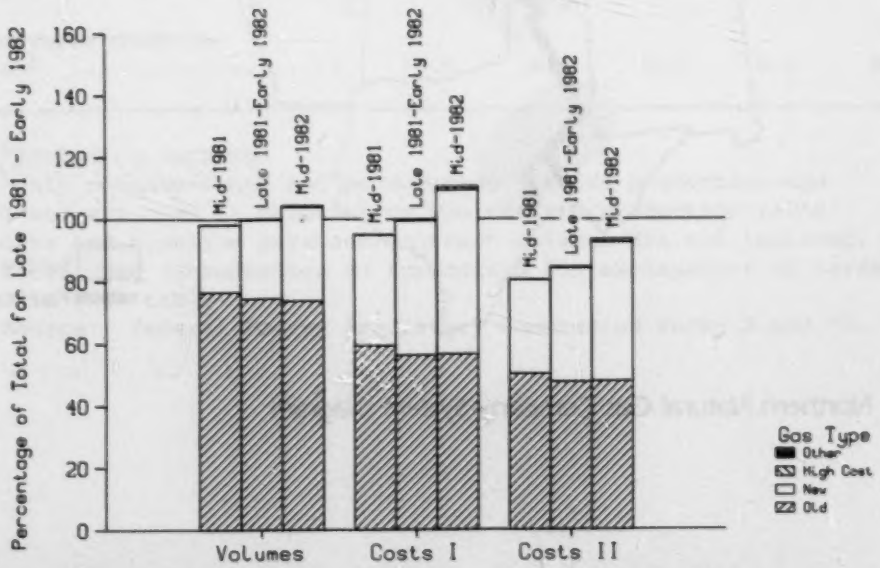


Figure B27. Projected Changes in Volumes and Costs of Wellhead Purchases of Major Gas Types, 1981-1982 for Natural Gas Pipeline Company of America

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Northern Natural Gas Company

Northern Natural Gas Company (Internorth) purchased approximately 817 Bcf of natural gas in 1981 (1 percent less than in 1980) at an average cost of $1.79 per Mcf (47 percent more than in 1980). In addition, 25 Bcf were produced from its owned reserves. Northern owns and operates natural gas pipelines extending from gas fields in Texas, New Mexico, Oklahoma, and Kansas to 71 distributors in Texas, Oklahoma, Kansas, Nebraska, Iowa, Illinois, South Dakota, Minnesota, Wisconsin, and Michigan. Northern also owns and operates underground storage facilities in Iowa and Kansas. Northern serves a large market; 753 resale, 5,287 industrials, and over 32,000 commercial customers.Northern is a partner in the new Trailblazer pipeline, which will give it further access to new discoveries in the Colorado-Wyoming area.

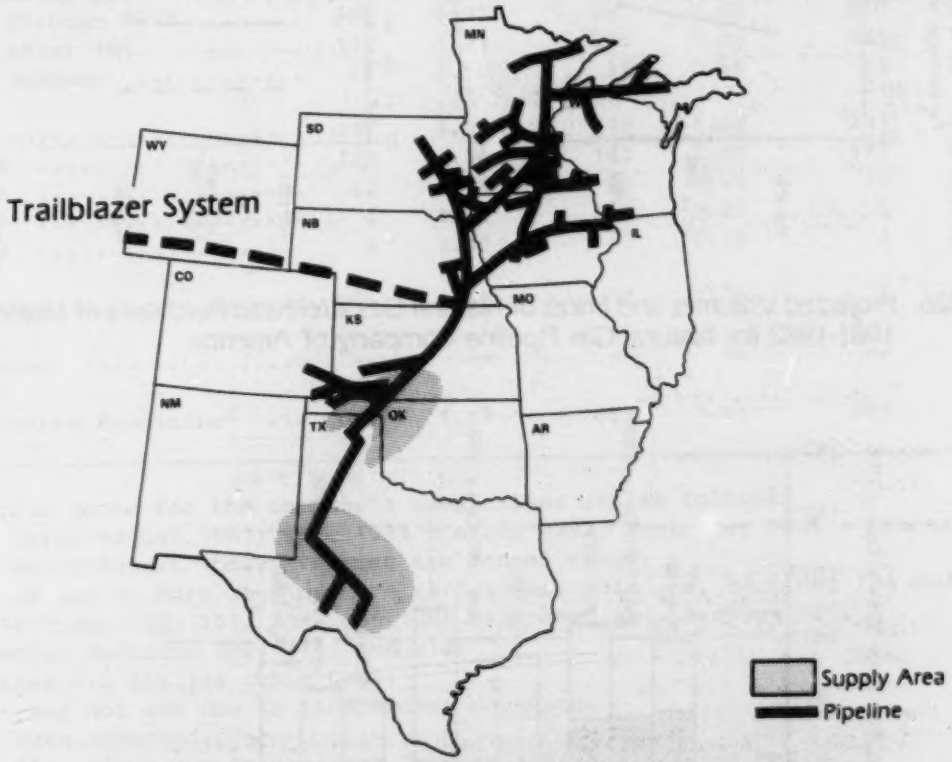


Figure B28. Northern Natural Gas Company System Diagram

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B19. Pipeline Supplies and Purchase Prices for Northern Natural Gas Company, 1977-1981
(Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Category	Year				
	1977	1978	1979	1980	1981
Supply Volumes					
Producer Contracts	759	758	795	787	768
Imports	0	0	0	3	25
Owned Production	5	8	12	15	27
Other Purchases	47	38	47	34	25
Total Supply	811	804	853	838	845
Average Prices					
Producer Contracts	0.59	0.70	1.00	1.33	1.65
Other Purchases[a]	1.29	1.49	2.31	2.74	3.88
Total Average Price	0.63	0.74	1.07	1.40	1.79
Domestic Reserves					
Company Owned	46	79	80	86	78
Producer Contract	7,610	7,251	7,071	6,993	6,787
Total Reserves	7,656	7,330	7,151	7,079	6,865
Reserve/Production Ratio[b]	10.0	9.5	8.8	8.8	8.6

[a]Including imports.

[b]Only company-owned and producer-contracted production and reserves are used in calculating the reserve/production ratio; imports and pipeline purchase/contract volumes are not included.

Note: See introduction to Appendix B for explanation of terms used in this table.

Source: Federal Energy Regulatory Commission Forms 2 and 15.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B20. PGA Projected Volumes and Prices of Natural Gas Wellhead Purchases for Northern Natural Gas Company, 1981-1982 (Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Type of Gas[b]	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
	Volume	Average Price	Volume	Average Price	Volume	Average Price
Old Gas	442	0.88	NA	NA	414	1.16
Vintage Through 1972	300	0.67	NA	NA	248	0.79
Vintage After 1972	57	1.26	NA	NA	96	1.83
Vintage Unknown	85	1.41	NA	NA	70	1.57
New Gas	282	2.90	NA	NA	256	3.07
NGPA 102	137	3.10	NA	NA	110	3.16
NGPA 103	119	2.51	NA	NA	106	2.83
NGPA 108	26	3.59	NA	NA	40	3.47
NGPA 109	--	--	NA	NA	([c])	2.33
High-Cost Gas	3	4.37	NA	NA	13	5.15
Miscellaneous	--	--	NA	NA	--	--
Total Projected Purchases[d]	727	1.68	NA	NA	683	1.95

[a]Effective dates for the company's submissions are as follows: mid-1981, January-December 1981; late 1981 - early 1982, none; mid-1982, January-December 1982. Volumes are annual rates.

[b]Types of gas by NGPA Sections are as follows: old gas, Sections 104 and 106; new gas, Sections 102, 103, 108, and 109; high-cost gas, Section 107; miscellaneous, Sections 105, 311, and 312.

[c]Less than 0.5 billion cubic feet.

[d]Totals may not sum due to independent rounding.

--, No data reported.

Note: All prices are in constant January 1982 dollars per Mcf.

Source: Federal Energy Regulatory Commission Purchased Gas Adjustment (PGA) Filing.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

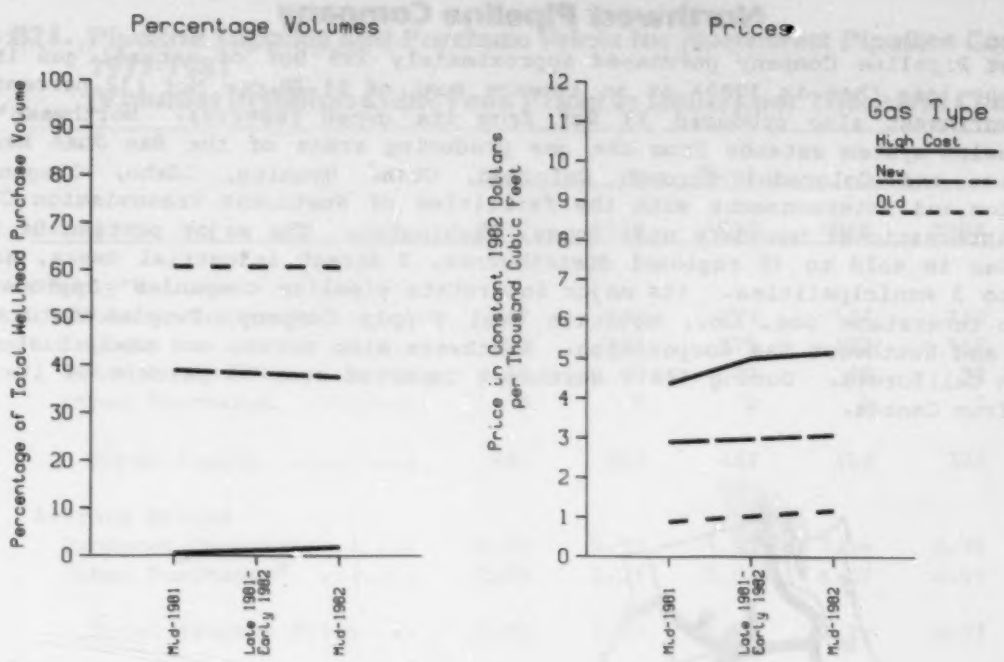


Figure B29. Projected Volumes and Prices of Natural Gas Wellhead Purchases of Major Gas Types, 1981-1982 for Northern Natural Gas Company

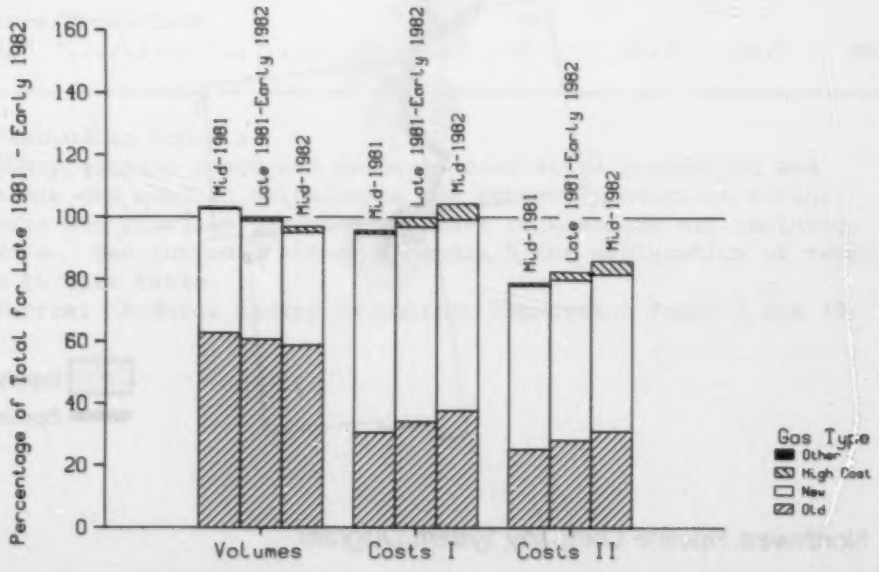


Figure B30. Projected Changes in Volumes and Costs of Wellhead Purchases of Major Gas Types, 1981-1982 for Northern Natural Gas Company

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Northwest Pipeline Company

Northwest Pipeline Company purchased approximately 299 Bcf of natural gas in 1981 (4 percent less than in 1980) at an average cost of $3.70 per Mcf (12 percent over 1980). Northwest also produced 33 Bcf from its owned reserves. Northwest's gas transmission system extends from the gas producing areas of the San Juan Basin in New Mexico and Colorado, through Colorado, Utah, Wyoming, Idaho, Oregon, and Washington and interconnects with the facilities of Westcoast Transmission Company at the international boundary near Sumas, Washington. The major portion of Northwest's Gas is sold to 15 regional distributors, 3 direct industrial users, and for resale to 3 municipalities. Its major interstate pipeline companies' customers are Colorado Interstate Gas, Co., Mountain Fuel Supply Company, Peoples Natural Gas Company and Southwest Gas Corporation. Northwest also serves one small customer in northern California. During 1981, Northwest imported over 50 percent of its total supply from Canada.

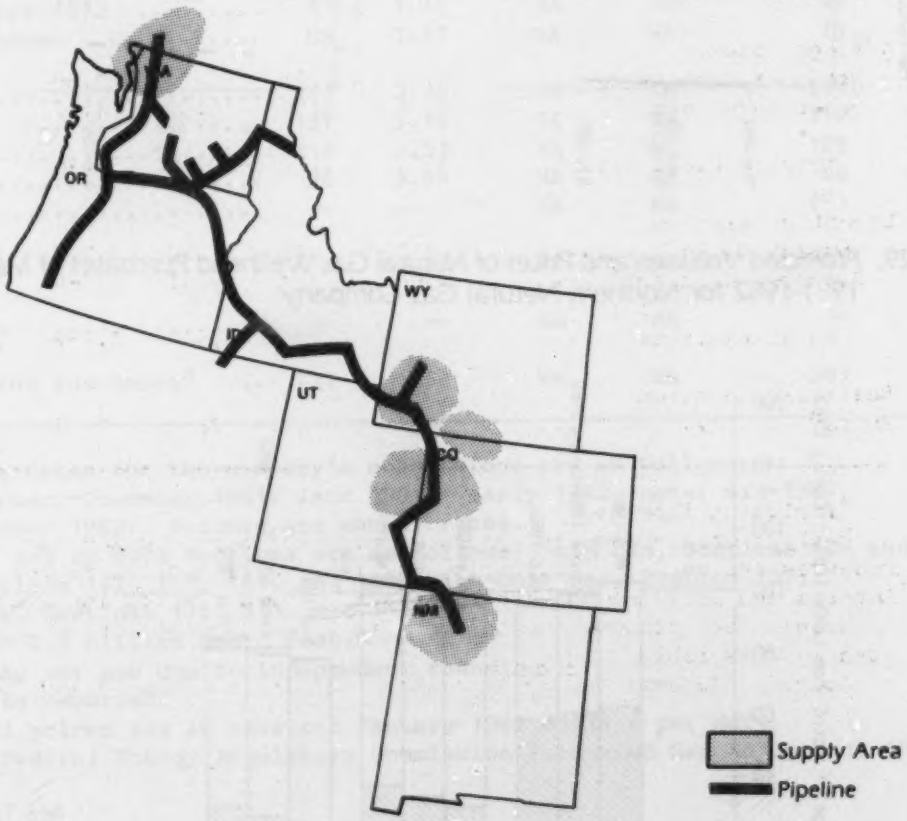


Figure B31. Northwest Pipeline Company System Diagram

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B21. Pipeline Supplies and Purchase Prices for Northwest Pipeline Company, 1977-1981
(Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Category	Year				
	1977	1978	1979	1980	1981
Supply Volumes					
Producer Contracts	117	114	121	121	132
Imports	287	249	279	192	167
Owned Production	39	40	42	40	33
Other Purchases	0	0	0	0	0
Total Supply	443	403	442	353	332
Average Prices					
Producer Contracts	0.69	0.91	1.22	1.56	2.16
Other Purchases[a]	1.98	2.21	2.61	4.37	4.91
Total Average Price	1.61	1.80	2.20	3.28	3.71
Domestic Reserves					
Company Owned	942	923	1,286	1,247	1,081
Producer Contract	3,168	3,237	3,325	3,389	3,685
Total Reserves	4,110	4,160	4,611	4,636	4,766
Reserve/Production Ratio[b]	26.3	27.1	28.2	28.7	28.8

[a]Including imports.

[b]Only company-owned and producer-contracted production and reserves are used in calculating the reserve/production ratio; imports and pipeline purchase/contract volumes are not included.

Note: See introduction to Appendix B for explanation of terms used in this table.

Source: Federal Energy Regulatory Commission Forms 2 and 15.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B22. PGA Projected Volumes and Prices of Natural Gas Wellhead Purchases for Northwest Pipeline Company, 1981-1982 (Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Type of Gas[b]	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
	Volume	Average Price	Volume	Average Price	Volume	Average Price
Old Gas	82	1.27	83	1.10	74	1.12
Vintage Through 1972	35	0.97	41	0.94	37	0.95
Vintage After 1972	42	1.37	41	1.23	36	1.26
Vintage Unknown	5	2.55	1	2.05	1	2.08
New Gas	53	3.02	71	2.76	82	2.82
NGPA 102	6	2.98	11	3.07	14	3.17
NGPA 103	40	2.98	52	2.69	57	2.73
NGPA 108	4	3.83	5	3.35	5	3.46
NGPA 109	2	2.34	4	2.27	5	2.26
High-Cost Gas	--	--	2	5.19	6	5.35
Miscellaneous	--	--	--	--	--	--
Total Projected Purchases[c]	135	1.97	156	1.90	162	2.14

[a]Effective dates for the company's submissions are as follows: mid-1981, April-September 1981; late 1981 - early 1982, October 1981 - March 1982; mid-1982, April-September 1982. Volumes are annual rates.

[b]Types of gas by NGPA Sections are as follows: old gas, Sections 104 and 106; new gas, Sections 102, 103, 108, and 109; high-cost gas, Section 107; miscellaneous, Sections 105, 311, and 312.

[c]Totals may not sum due to independent rounding.

--, No data reported.

Note: All prices are in constant January 1982 dollars per Mcf.

Source: Federal Energy Regulatory Commission Purchased Gas Adjustment (PGA) Filing.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

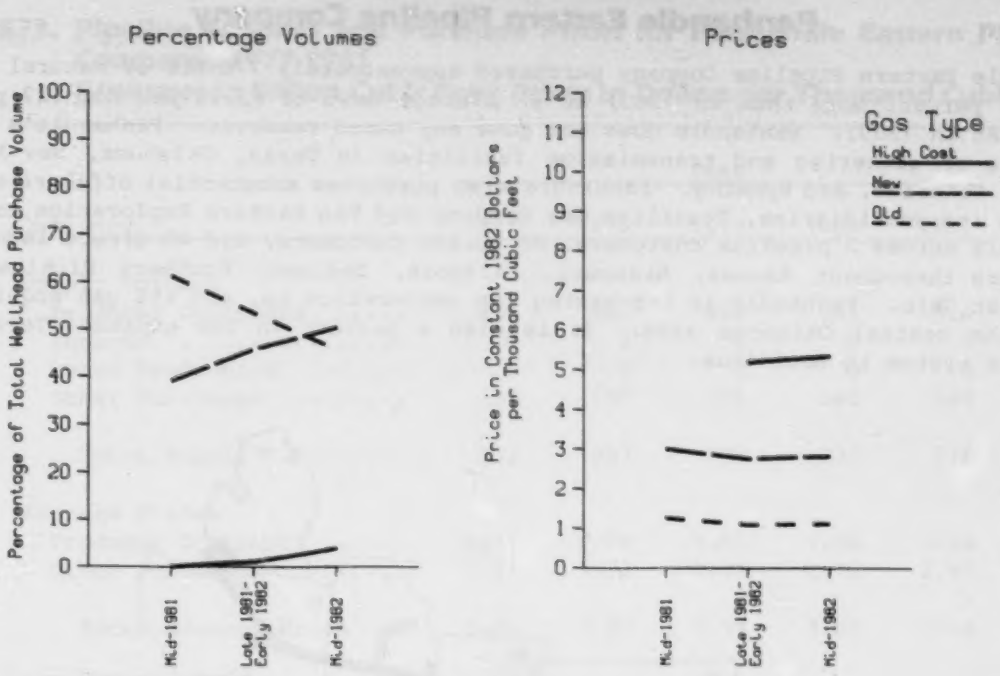


Figure B32. Projected Volumes and Prices of Natural Gas Wellhead Purchases of Major Gas Types, 1981-1982 for Northwest Pipeline Company

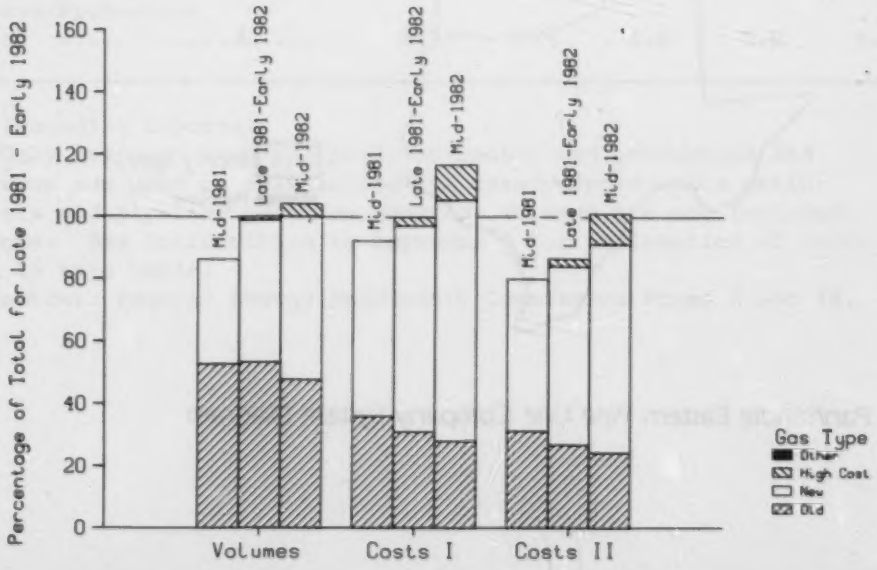


Figure B33. Projected Changes in Volumes and Costs of Wellhead Purchases of Major Gas Types, 1981-1982 for Northwest Pipeline Company

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Panhandle Eastern Pipeline Company

Panhandle Eastern Pipeline Company purchased approximately 776 Bcf of natural gas in 1981 (6 percent more than in 1980) at an average cost of $2.03 per Mcf (27 percent more than in 1980). Panhandle does not have any owned reserves. Panhandle's system consists of gathering and transmission facilities in Texas, Oklahoma, New Mexico, Kansas, Colorado, and Wyoming. Panhandle also purchases substantial offshore volumes through its subsidiaries, Trunkline Gas Company and Pan Eastern Exploration Company. Panhandle serves 2 pipeline customers, 80 resale customers, and 40 direct industrial customers throughout Kansas, Missouri, Illinois, Indiana, Southern Michigan, and Northwest Ohio. Panhandle is increasing its exploration in, and its gas acquisition from, the central Oklahoma area. It is also a partner in the expanded Terrebonne pipeline system in Louisiana.

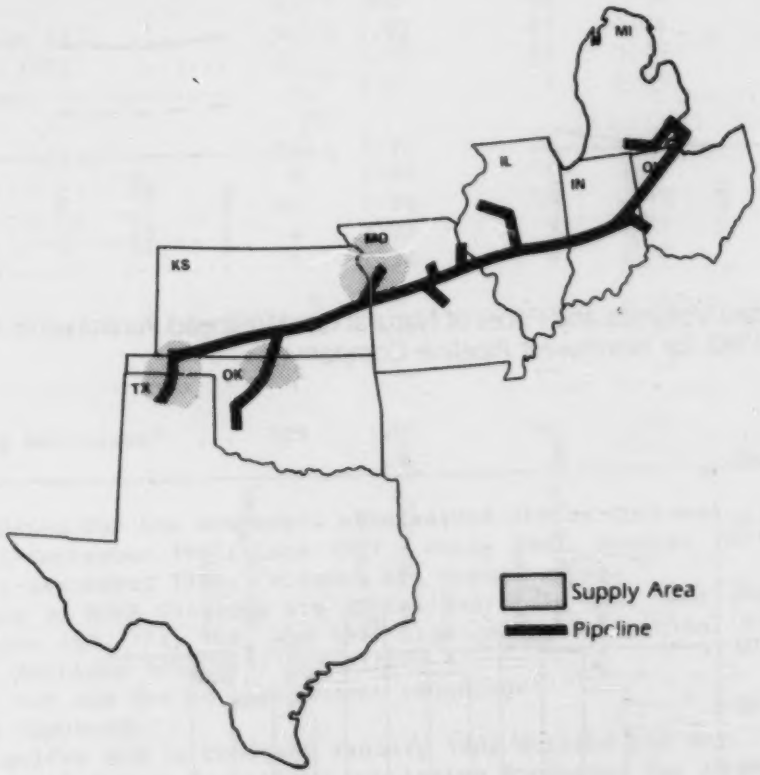


Figure B34. Panhandle Eastern Pipe Line Company System Diagram

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B23. Pipeline Supplies and Purchase Prices for Panhandle Eastern Pipeline Company, 1977-1981
(Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Category	Year				
	1977	1978	1979	1980	1981
Supply Volumes					
Producer Contracts	455	480	494	493	526
Imports	0	0	0	0	0
Owned Production	0	0	0	0	0
Other Purchases	177	207	245	240	249
Total Supply	632	687	739	733	775
Average Prices					
Producer Contracts	0.65	0.71	1.05	1.36	1.64
Other Purchases[a]	1.31	1.33	1.83	2.10	2.87
Total Average Price	0.83	0.89	1.31	1.60	2.04
Domestic Reserves					
Company Owned	0	0	0	0	0
Producer Contract	4,239	4,124	4,333	4,316	4,183
Total Reserves	4,239	4,124	4,333	4,316	4,183
Reserve/Production Ratio[b]	6.7	6.0	5.8	5.8	5.3

[a]Including imports.

[b]Only company-owned and producer-contracted production and reserves are used in calculating the reserve/production ratio; imports and pipeline purchase/contract volumes are not included.

Note: See introduction to Appendix B for explanation of terms used in this table.

Source: Federal Energy Regulatory Commission Forms 2 and 15.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B24. PGA Projected Volumes and Prices of Natural Gas Wellhead Purchases for Panhandle Eastern Pipeline Company, 1981-1982 (Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Type of Gas[b]	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
	Volume	Average Price	Volume	Average Price	Volume	Average Price
Old Gas	354	0.95	326	0.91	321	0.92
Vintage Through 1972	307	0.78	288	0.76	265	0.75
Vintage After 1972	47	1.88	38	1.85	56	1.75
Vintage Unknown	([c])	2.16	([c])	1.78	--	--
New Gas	150	2.94	187	2.87	193	2.99
NGPA 102	37	2.96	44	2.92	42	3.34
NGPA 103	100	2.94	124	2.87	139	2.88
NGPA 108	4	3.67	6	3.58	6	3.67
NGPA 109	10	2.52	13	2.28	6	2.23
High-Cost Gas	4	5.14	4	6.42	7	7.40
Miscellaneous	3	2.73	3	2.83	3	2.80
Total Projected Purchases[d]	511	1.57	520	1.65	524	1.77

[a]Effective dates for the company's submissions are as follows: mid-1981, March-August 1981; late 1981 - early 1982, September 1981 - February 1982; mid-1982, March-August 1982. Volumes are annual rates.

[b]Types of gas by NGPA Sections are as follows: old gas, Sections 104 and 106; new gas, Sections 102, 103, 108, and 109; high-cost gas, Section 107; miscellaneous, Sections 105, 311, and 312.

[c]Less than 0.5 billion cubic feet.

[d]Totals may not sum due to independent rounding.

--, No data reported.

Note: All prices are in constant January 1982 dollars per Mcf.

Source: Federal Energy Regulatory Commission Purchased Gas Adjustment (PGA) Filing.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

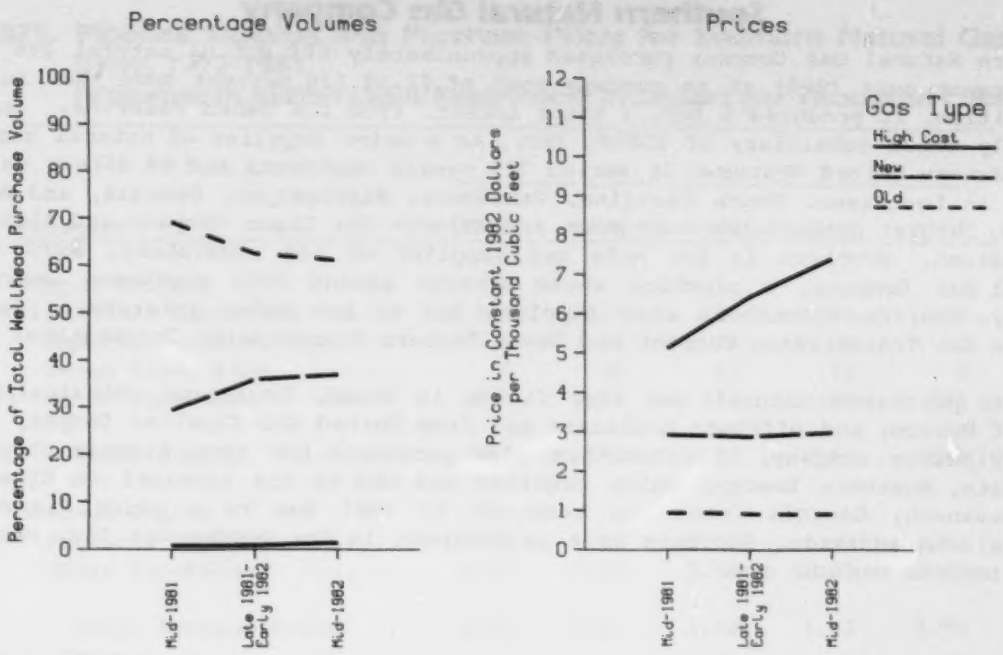


Figure B35. Projected Volumes and Prices of Natural Gas Wellhead Purchases of Major Gas Types, 1981-1982 for Panhandle Eastern Pipeline Company

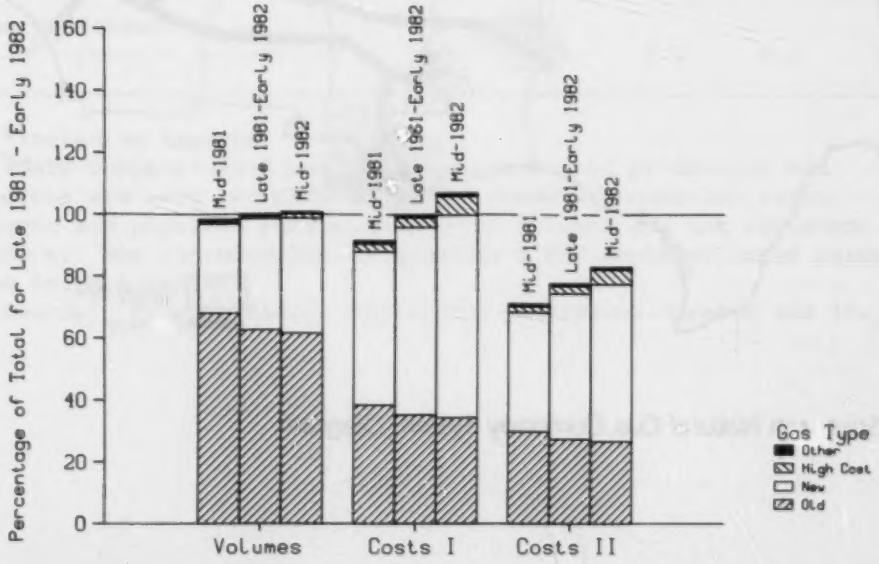


Figure B36. Projected Changes in Volumes and Costs of Wellhead Purchases of Major Gas Types, 1981-1982 for Panhandle Eastern Pipeline Company

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Southern Natural Gas Company

Southern Natural Gas Company purchased approximately 678 Bcf of natural gas in 1981 (13 percent over 1980) at an average cost of $2.55 (36 percent more than in 1980). In addition, it produced 5 Bcf, a minor amount, from its owned reserves. Southern, a wholly owned subsidiary of SONAT, Inc., is a major supplier of natural gas in the southeastern United States. It serves 121 resale customers and 64 direct sale customers in Louisiana, South Carolina, Tennessee, Mississippi, Georgia, and Alabama. Its two largest distributor customers are Atlanta Gas Light Company and Alabama Gas Corporation. Southern is the sole gas supplier of its subsidiary, South Georgia Natural Gas Company, a pipeline whose markets extend into southwest Georgia and northern Florida. Southern also supplies gas to two other interstate pipelines, Florida Gas Transmission Company and Texas Eastern Transmission Corporation.

Southern purchases natural gas from fields in Texas, Louisiana, Mississippi, the Gulf of Mexico, and offshore Louisiana and from United Gas Pipeline Company and Sea Robin Pipeline Company. Southern has also purchased LNG from Algeria through its affiliate, Southern Energy, which received the LNG at its terminal on Elba Island near Savannah, Georgia (none was received in 1981 due to a price dispute with Algeria). In addition, Southern is a participant in the Border Gas Inc. consortium which imports Mexican gas.

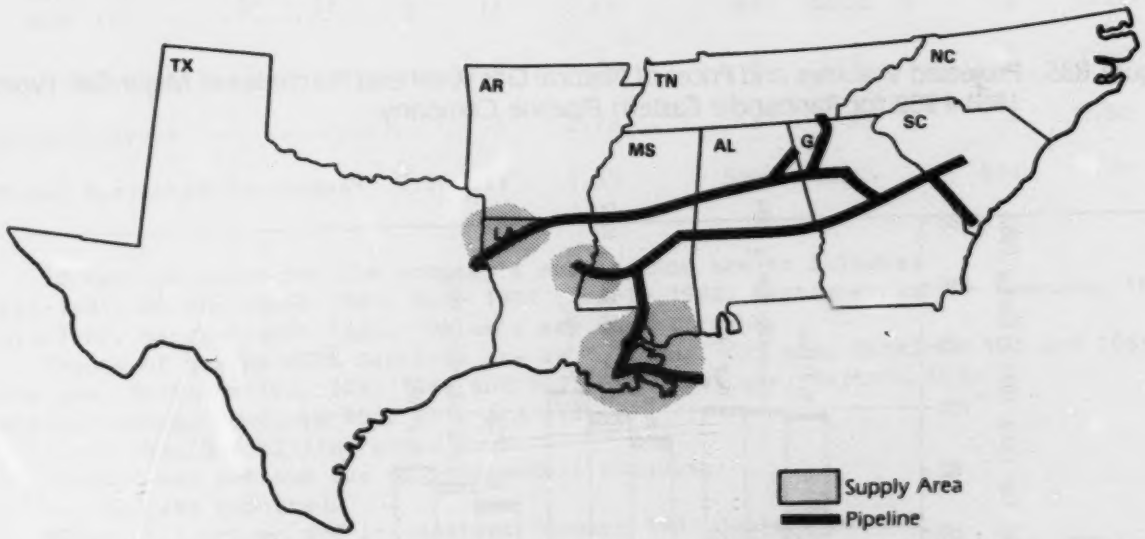


Figure B37. Southern Natural Gas Company System Diagram

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B25. Pipeline Supplies and Purchase Prices for Southern Natural Gas Company, 1977-1981
(Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Category	Year				
	1977	1978	1979	1980	1981
Supply Volumes					
Producer Contracts	343	331	345	392	459
Imports	0	22	92	27	7
Owned Production	5	16	21	12	5
Other Purchases	204	226	174	181	212
Total Supply	552	595	632	612	683
Average Prices					
Producer Contracts	0.55	0.73	1.15	1.68	2.52
Other Purchases[a]	1.22	1.33	2.05	2.23	2.61
Total Average Price ..	0.80	0.99	1.54	1.87	2.55
Domestic Reserves					
Company Owned	224	183	155	146	89
Producer Contract	1,939	2,195	2,148	2,359	2,503
Total Reserves	2,163	2,378	2,303	2,505	2,592
Reserve/Production Ratio[b]	6.2	6.8	6.2	6.2	5.5

[a]Including imports.

[b]Only company-owned and producer-contracted production and reserves are used in calculating the reserve/production ratio; imports and pipeline purchase/contract volumes are not included.

Note: See introduction to Appendix B for explanation of terms used in this table.

Source: Federal Energy Regulatory Commission Forms 2 and 15.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B26. PGA Projected Volumes and Prices of Natural Gas Wellhead Purchases for Southern Natural Gas Company, 1981-1982 (Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
Type of Gas[b]	Volume	Average Price	Volume	Average Price	Volume	Average Price
Old Gas	248	1.17	249	1.21	237	1.18
Vintage Through 1972	109	0.78	93	0.80	106	0.70
Vintage After 1972	138	1.49	144	1.54	131	1.56
Vintage Unknown	1	0.88	12	0.50	([c])	0.80
New Gas	137	2.93	141	3.02	179	3.03
NGPA 102	103	3.04	111	3.11	129	3.17
NGPA 103	29	2.67	27	2.69	30	2.71
NGPA 108	([c])	3.14	1	3.16	8	3.18
NGPA 109	5	2.25	2	2.30	13	2.30
High-Cost Gas	69	7.02	56	8.80	42	8.09
Miscellaneous	--	--	--	--	--	--
Total Projected Purchases[d]	453	2.59	445	2.73	458	2.53

[a]Effective dates for the company's submissions are as follows: mid-1981, January-June 1981; late 1981 - early 1982, July-December 1981; mid-1982, January-June 1982. Volumes are annual rates.

[b]Types of gas by NGPA Sections are as follows: old gas, Sections 104 and 106; new gas, Sections 102, 103, 108, and 109; high-cost gas, Section 107; miscellaneous, Sections 105, 311, and 312.

[c]Less than 0.5 billion cubic feet.

[d]Totals may not sum due to independent rounding.

--, No data reported.

Note: All prices are in constant January 1982 dollars per Mcf.

Source: Federal Energy Regulatory Commission Purchased Gas Adjustment (PGA) filing.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

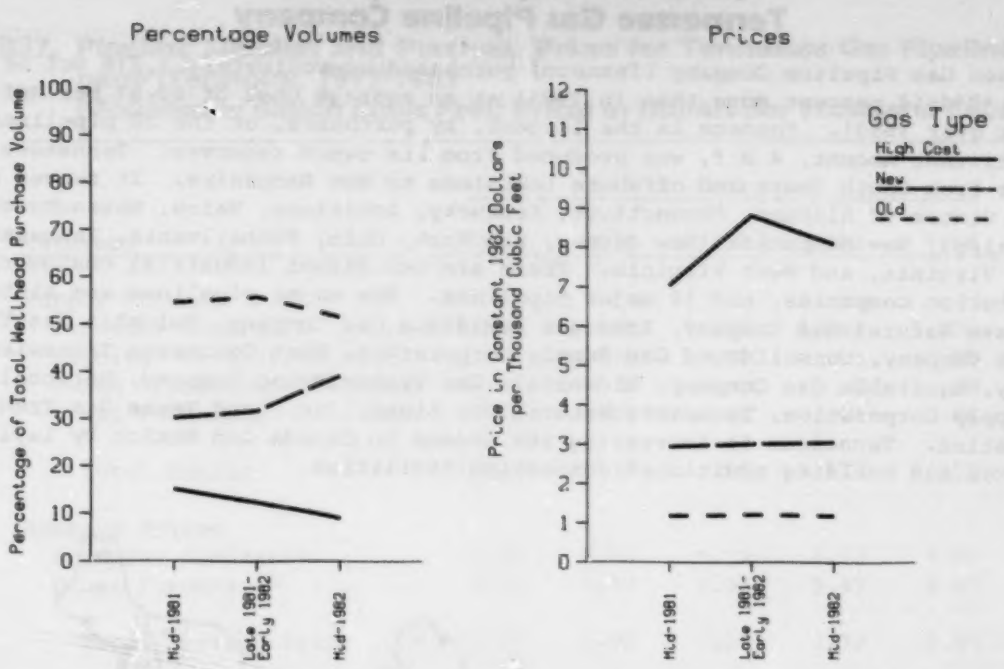


Figure B38. Projected Volumes and Prices of Natural Gas Wellhead Purchases of Major Gas Types, 1981-1982 for Southern Natural Gas Company

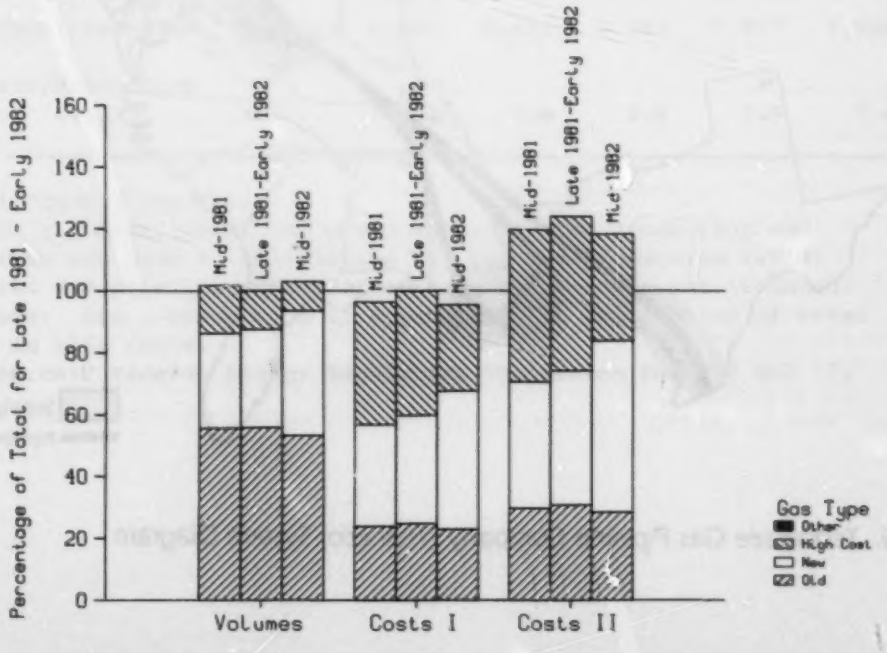


Figure B39. Projected Changes in Volumes and Costs of Wellhead Purchases of Major Gas Types, 1981-1982 for Southern Natural Gas Company

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Tennessee Gas Pipeline Company

Tennessee Gas Pipeline Company (Tenneco) purchased approximately 1,216 Bcf of natural gas in 1981 (4 percent more than in 1981) at an average cost of $2.21 per Mcf (28 percent over 1980). Tenneco is the largest, by purchases, of the 20 pipelines. An insignificant amount, 4 Bcf, was produced from its owned reserves. Tennessee's system extends from South Texas and offshore Louisiana to New Hampshire. It serves customers in the States of Alabama, Connecticut, Kentucky, Louisiana, Maine, Massachusetts, Mississippi, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Tennessee, Texas, Virginia, and West Virginia. There are one direct industrial customer, 93 distribution companies, and 10 major pipelines. The major pipelines are Alabama-Tennessee Natural Gas Company, Arkansas Louisiana Gas Company, Columbia Gas Transmission Company, Consolidated Gas Supply Corporation, East Tennessee Transmission Company, Equitable Gas Company, Midwestern Gas Transmission Company, National Fuel Gas Supply Corporation, Tennessee Natural Gas Lines, Inc., and Texas Gas Transmission Corporation. Tennessee is increasing its access to Canada and Mexico by laying new pipelines and building additional connection facilities.

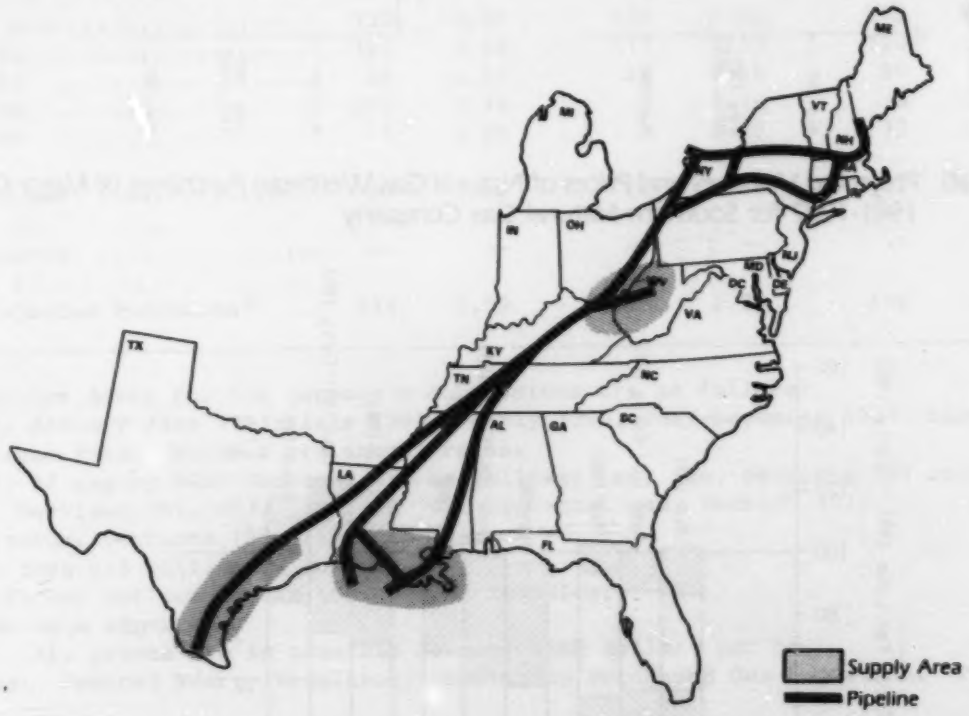


Figure B40. Tennessee Gas Pipeline Company (Tenneco) System Diagram

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B27. Pipeline Supplies and Purchase Prices for Tennessee Gas Pipeline Company (Tenneco), 1977-1981
(Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Category	Year				
	1977	1978	1979	1980	1981
Supply Volumes					
Producer Contracts	1,087	1,066	1,092	1,044	1,070
Imports	0	0	19	43	59
Owned Production	12	8	9	8	8
Other Purchases	42	45	43	83	88
Total Supply	1,141	1,119	1,163	1,178	1,225
Average Prices					
Producer Contracts	0.70	0.88	1.22	1.52	1.99
Other Purchases[a]	1.05	1.17	1.98	3.47	3.81
Total Average Price	0.72	0.90	1.26	1.73	2.21
Domestic Reserves					
Company Owned	192	188	100	156	189
Producer Contract	8,465	8,290	8,163	7,801	7,799
Total Reserves	8,657	8,478	8,263	7,957	7,988
Reserve/Production Ratio[b]	7.8	7.8	7.5	7.5	7.4

[a]Including imports.

[b]Only company-owned and producer-contracted production and reserves are used in calculating the reserve/production ratio; imports and pipeline purchase/contract volumes are not included.

Note: See introduction to Appendix B for explanation of terms used in this table.

Source: Federal Energy Regulatory Commission Forms 2 and 15.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B28. PGA Projected Volumes and Prices of Natural Gas Wellhead Purchases for Tennessee Gas Pipeline Company (Tenneco), 1981-1982 (Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Type of Gas[b]	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
	Volume	Average Price	Volume	Average Price	Volume	Average Price
Old Gas	786	1.53	757	1.50	667	1.54
Vintage Through 1972	505	1.23	504	1.24	406	1.18
Vintage After 1972	281	2.06	253	2.02	261	2.11
Vintage Unknown	--	--	--	--	--	--
New Gas	236	2.97	294	3.06	336	3.15
NGPA 102	159	3.06	219	3.14	296	3.21
NGPA 103	65	2.77	60	2.80	62	2.86
NGPA 108	4	4.13	6	3.94	5	3.85
NGPA 109	8	2.23	9	2.27	4	2.45
High-Cost Gas	5	4.91	24	8.43	61	7.86
Miscellaneous	(c)	1.84	(c)	1.92	10	2.01
Total Projected Purchases[d]	1037	1.87	1075	2.08	1094	2.43

[a]Effective dates for the company's submissions are as follows: mid-1981, January-June 1981; late 1981 - early 1982, July-December 1981; mid-1982, January-June 1982. Volumes are annual rates.

[b]Types of gas by NGPA Sections are as follows: old gas, Sections 104 and 106; new gas, Sections 102, 103, 108, and 109; high-cost gas, Section 107; miscellaneous, Sections 105, 311, and 312.

[c]Less than 0.5 billion cubic feet.

[d]Totals may not sum due to independent rounding.

--, No data reported.

Note: All prices are in constant January 1982 dollars per Mcf.

Source: Federal Energy Regulatory Commission Purchased Gas Adjustment (PGA) Filing.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

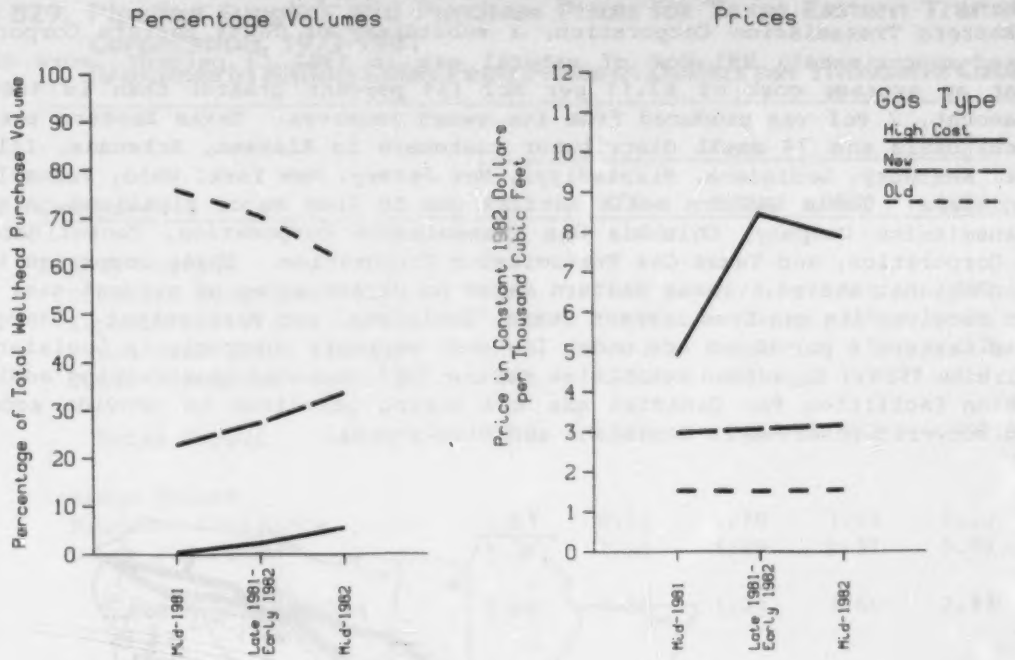


Figure B41. Projected Volumes and Prices of Natural Gas Wellhead Purchases of Major Gas Types, 1981-1982 for Tennessee Gas Pipeline Company

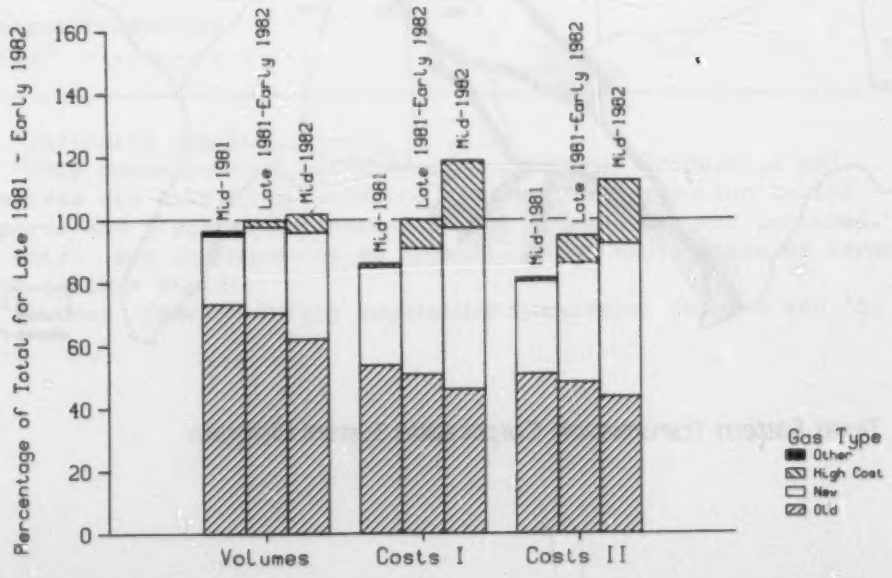


Figure B42. Projected Changes in Volumes and Costs of Wellhead Purchases of Major Gas Types, 1981-1982 for Tennessee Gas Pipeline Company

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Texas Eastern Transmission Corporation

Texas Eastern Transmission Corporation, a subsidiary of Texas Eastern Corporation, purchased approximately 991 Bcf of natural gas in 1981 (3 percent more than in 1980) at an average cost of $2.11 per Mcf (31 percent greater than in 1980). A small amount, 2 Bcf was produced from its owned reserves. Texas Eastern serves 24 large customers and 74 small distributor customers in Alabama, Arkansas, Illinois, Indiana, Kentucky, Louisiana, Mississippi, New Jersey, New York, Ohio, Pennsylvania, and Tennessee. Texas Eastern sells natural gas to four major pipelines, Algonquin Gas Transmission Company, Columbia Gas Transmission Corporation, Consolidated Gas Supply Corporation, and Texas Gas Transmission Corporation. These companies in turn serve additional states. Texas Eastern makes no direct sales of natural gas. Texas Eastern receives its gas from eastern Texas, Louisiana, and Mississippi. One-quarter of Texas Eastern's purchases are under low-cost warranty contracts in Louisiana, due to expire in 1986. Expansion activities during 1981 included constructing additional connection facilities for Canadian gas and laying pipelines to provide access to newly discovered reserves in Louisiana and Mississippi.

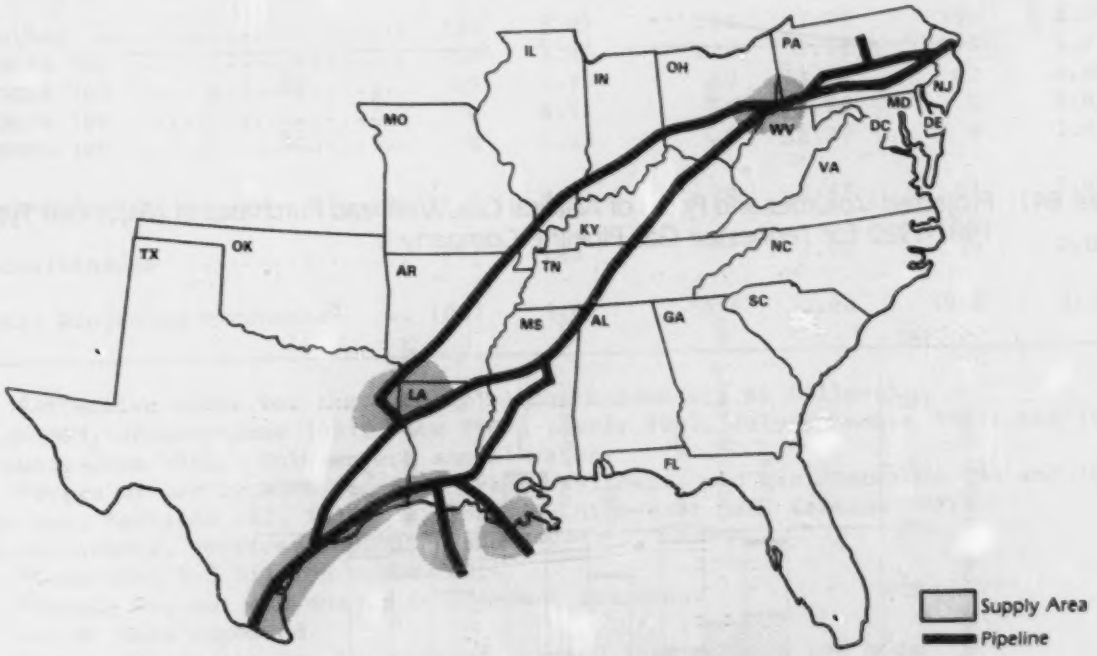


Figure B43. Texas Eastern Transmission Corporation System Diagram

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B29. Pipeline Supplies and Purchase Prices for Texas Eastern Transmission Corporation, 1977-1981
(Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Category	Year				
	1977	1978	1979	1980	1981
Supply Volumes					
Producer Contracts	566	571	573	543	493
Imports	2	0	0	19	33
Owned Production	4	3	3	3	2
Other Purchases	308	296	370	397	464
Total Supply	880	870	946	962	992
Average Prices					
Producer Contracts	0.61	0.62	0.78	1.03	1.20
Other Purchases[a]	1.25	1.33	1.89	2.37	3.00
Total Average Price	0.84	0.86	1.21	1.60	2.11
Domestic Reserves					
Company Owned	17	11	21	19	14
Producer Contract	3,960	3,530	3,239	3,104	2,644
Total Reserves	3,977	3,541	3,260	3,123	2,658
Reserve/Production Ratio[b]	6.9	6.1	5.6	5.7	5.3

[a]Including imports.

[b]Only company-owned and producer-contracted production and reserves are used in calculating the reserve/production ratio; imports and pipeline purchase/contract volumes are not included.

Note: See introduction to Appendix B for explanation of terms used in this table.

Source: Federal Energy Regulatory Commission Forms 2 and 15.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B30. PGA Projected Volumes and Prices of Natural Gas Wellhead Purchases for Texas Eastern Transmission Corporation, 1981-1982 (Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Type of Gas[b]	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
	Volume	Average Price	Volume	Average Price	Volume	Average Price
Old Gas	451	0.80	406	0.88	393	0.91
Vintage Through 1972	337	0.45	288	0.47	295	0.61
Vintage After 1972	114	1.83	118	1.88	98	1.84
Vintage Unknown	(c)	0.46	(c)	0.75	(c)	0.47
New Gas	103	2.93	100	3.00	89	3.06
NGPA 102	77	3.01	74	3.10	64	3.17
NGPA 103	25	2.72	24	2.76	23	2.78
NGPA 108	(c)	3.32	(c)	3.40	1	3.50
NGPA 109	1	2.41	2	2.33	1	2.37
High-Cost Gas	--	--	3	4.50	3	5.87
Miscellaneous	--	--	--	--	--	--
Total Projected Purchases[d]	554	1.20	509	1.32	485	1.34

[a]Effective dates for the company's submissions are as follows: mid-1981, February-July 1981; late 1981 - early 1982, August 1981 - January 1982; mid-1982, February-July 1982. Volumes are annual rates.

[b]Types of gas by NGPA Sections are as follows: old gas, Sections 104 and 106; new gas, Sections 102, 103, 108, and 109; high-cost gas, Section 107; miscellaneous, Sections 105, 311, and 312.

[c]Less than 0.5 billion cubic feet.

[d]Totals may not sum due to independent rounding.

--, No data reported.

Note: All prices are in constant January 1982 dollars per Mcf.

Source: Federal Energy Regulatory Commission Purchased Gas Adjustment (PGA) Filing.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

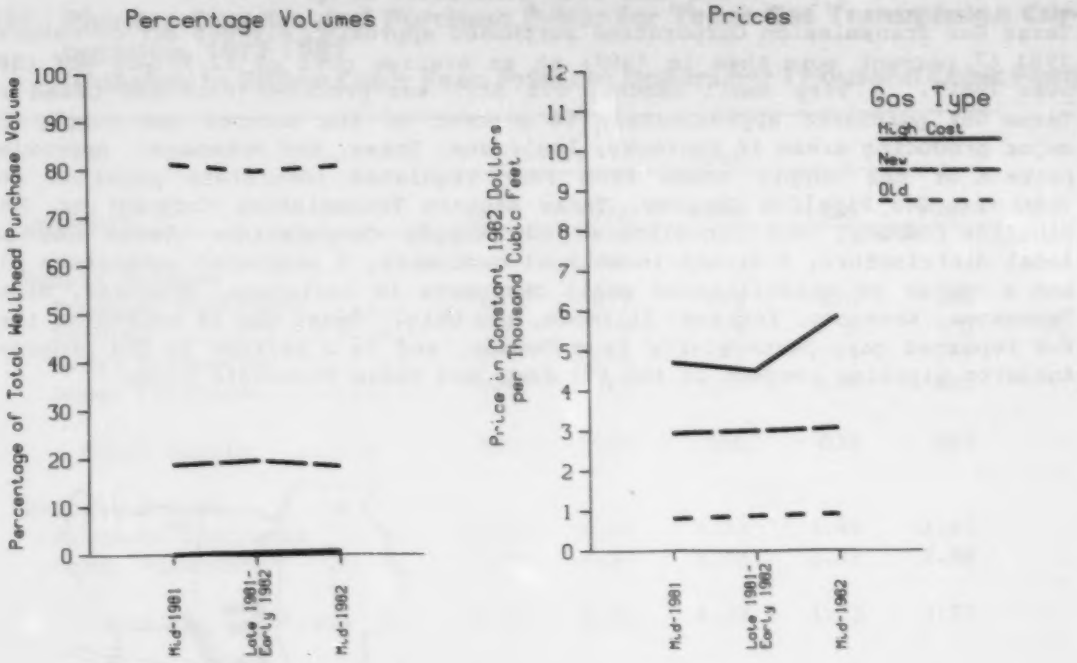


Figure B44. Projected Volumes and Prices of Natural Gas Wellhead Purchases of Major Gas Types, 1981-1982 for Texas Eastern Transmission Corporation

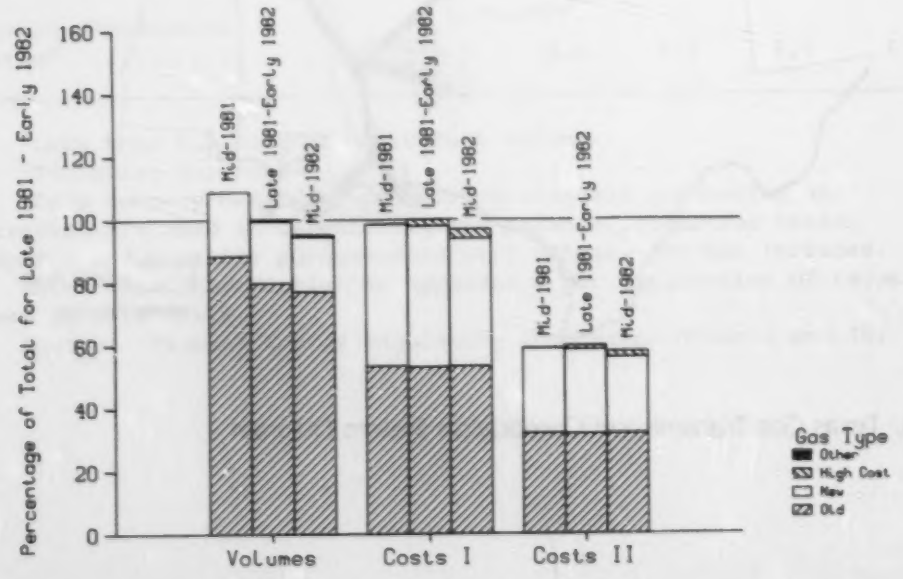


Figure B45. Projected Changes in Volumes and Costs of Wellhead Purchases of Major Gas Types, 1981-1982 for Texas Eastern Transmission Corporation

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Texas Gas Transmission Corporation

Texas Gas Transmission Corporation purchased approximately 685 Bcf of natural gas in 1981 (7 percent more than in 1980) at an average cost of $2.37 per Mcf (38 percent over 1980). A very small amount, 0.3 Bcf, was produced from its owned reserves. Texas Gas purchases approximately 58 percent of its natural gas supply from four major producing areas in Kentucky, Louisiana, Texas, and Arkansas. Approximately 38 percent of the supply comes from four regulated interstate pipeline companies: Tennessee Gas Pipeline Company, Texas Eastern Transmission Corporation, United Gas Pipeline Company, and Consolidated Gas Supply Corporation. Texas Gas serves 87 local distributors, 6 direct industrial customers, 9 regulated interstate pipelines, and a number of miscellaneous small customers in Louisiana, Arkansas, Mississippi, Tennessee, Kentucky, Indiana, Illinois, and Ohio. Texas Gas is expanding its hookups for imported gas, particularly from Canada, and is a partner in the proposed Trans-Anadarko pipeline project in the Oklahoma and Texas Panhandle areas.

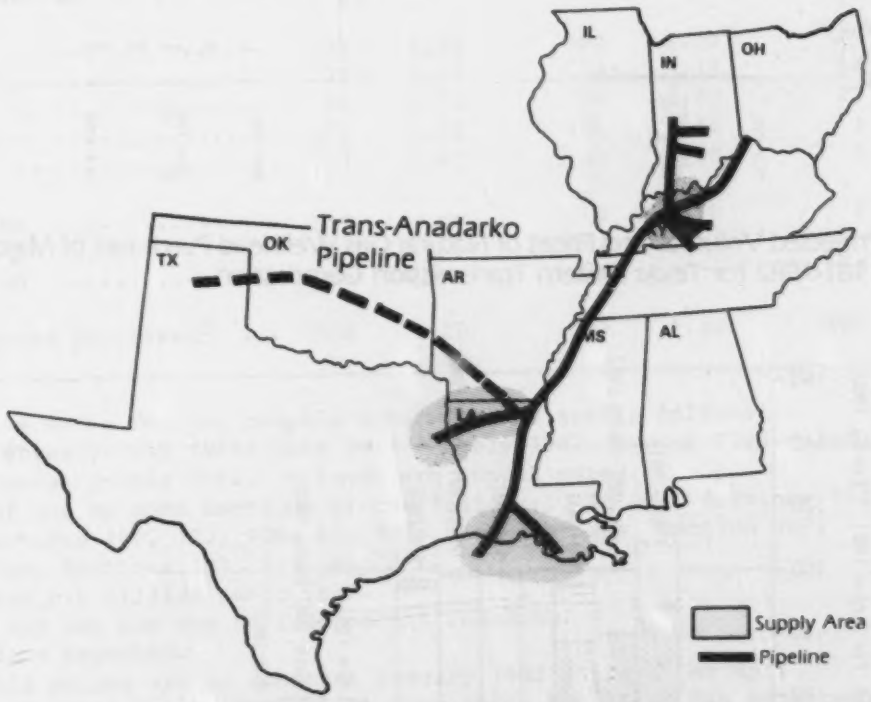


Figure B46. Texas Gas Transmission Corporation System Diagram

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B31. Pipeline Supplies and Purchase Prices for Texas Gas Transmission Corporation, 1977-1981
(Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Category	Year				
	1977	1978	1979	1980	1981
Supply Volumes					
Producer Contracts	401	417	435	420	426
Imports	0	0	0	0	0
Owned Production	(a)	(a)	(a)	(a)	(a)
Other Purchases	166	160	211	218	260
Total Supply	567	577	646	638	686
Average Prices					
Producer Contracts	0.53	0.68	1.03	1.49	2.05
Other Purchases[b]	1.20	1.27	1.78	2.17	2.64
Total Average Price	0.73	0.85	1.27	1.72	2.27
Domestic Reserves					
Company Owned	(a)	(a)	(a)	(a)	(a)
Producer Contract	2,730	2,596	2,603	2,918	2,617
Total Reserves	2,730	2,596	2,603	2,918	2,617
Reserve/Production Ratio[c]	6.8	6.2	5.9	6.9	6.1

[a]Less than 0.5 billion cubic feet volume.
[b]Including imports.
[c]Only company-owned and producer-contracted production and reserves are used in calculating the reserve/production ratio; imports and pipeline purchase/contract volumes are not included.

Note: See introduction to Appendix B for explanation of terms used in this table.

Source: Federal Energy Regulatory Commission Forms 2 and 15.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B32. PGA Projected Volumes and Prices of Natural Gas Wellhead Purchases for Texas Gas Transmission Corporation, 1981-1982 (Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Type of Gas[b]	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
	Volume	Average Price	Volume	Average Price	Volume	Average Price
Old Gas	323	1.20	320	1.21	308	1.22
Vintage Through 1972	109	0.89	95	0.85	100	0.91
Vintage After 1972	214	1.36	225	1.36	208	1.38
Vintage Unknown	--	--	--	--	--	--
New Gas	118	2.84	103	2.93	99	3.00
NGPA 102	75	2.96	70	3.05	67	3.14
NGPA 103	40	2.63	31	2.67	30	2.67
NGPA 108	1	3.09	1	3.12	2	3.24
NGPA 109	3	2.29	1	2.17	(c)	2.20
High-Cost Gas	26	7.23	36	8.93	44	7.98
Miscellaneous	--	--	--	--	--	--
Total Projected Purchases[d]	468	1.95	459	2.20	451	2.27

[a]Effective dates for the company's submissions are as follows: mid-1981, February-July 1981; late 1981 - early 1982, August 1981 - January 1982; mid-1982, February-July 1982. Volumes are annual rates.

[b]Types of gas by NGPA Sections are as follows: old gas, Sections 104 and 106; new gas, Sections 102, 103, 108, and 109; high-cost gas, Section 107; miscellaneous, Sections 105, 311, and 312.

[c]Less than 0.5 billion cubic feet.

[d]Totals may not sum due to independent rounding.

--, No data reported.

Note: All prices are in constant January 1982 dollars per Mcf.

Source: Federal Energy Regulatory Commission Purchased Gas Adjustment (PGA) Filing.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

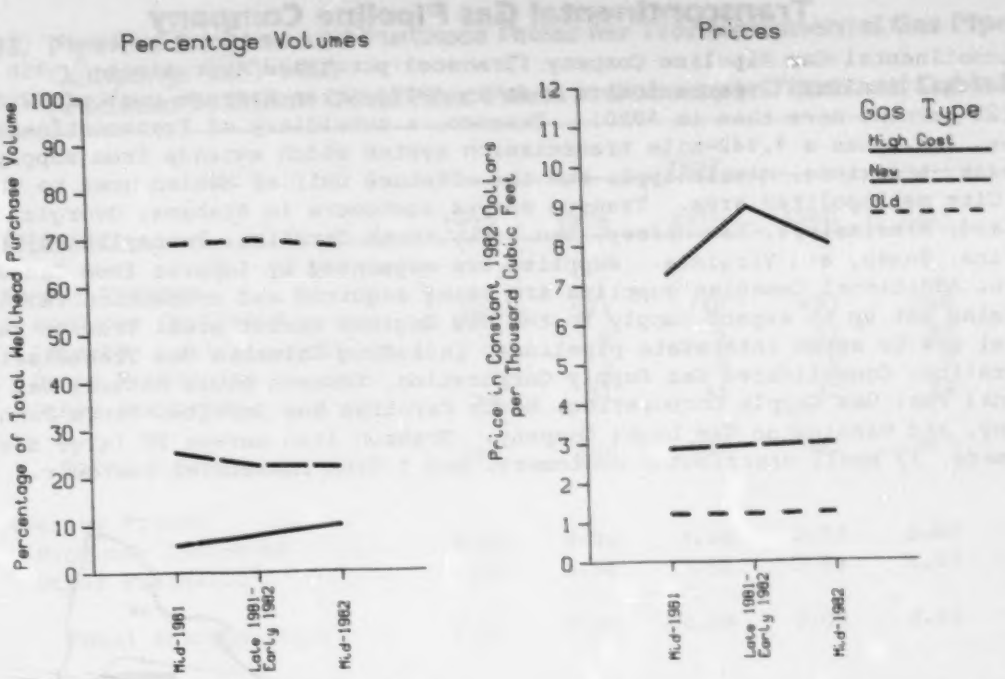


Figure B47. Projected Volumes and Prices of Natural Gas Wellhead Purchases of Major Gas Types, 1981-1982 for Texas Gas Transmission Corporation

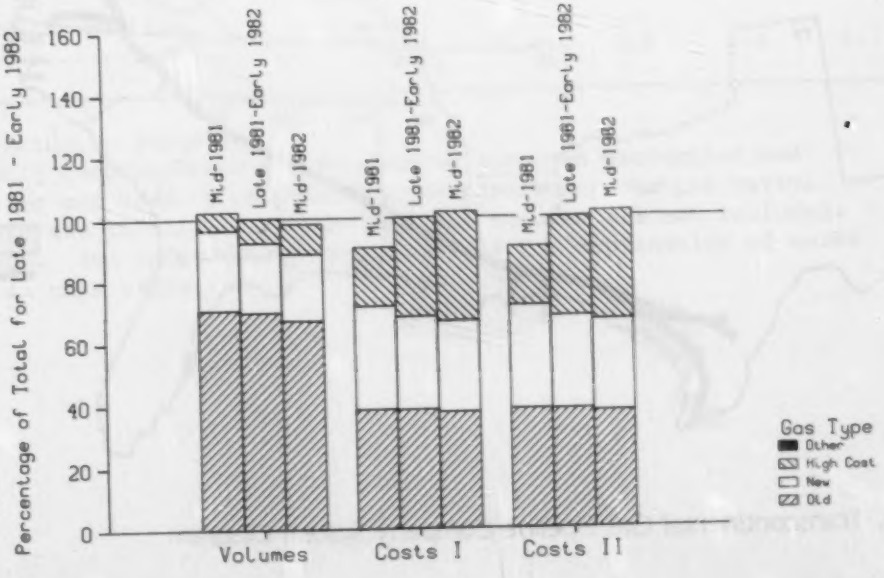


Figure B48. Projected Changes in Volumes and Costs of Wellhead Purchases of Major Gas Types, 1981-1982 for Texas Gas Transmission Corporation

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Transcontinental Gas Pipeline Company

Transcontinental Gas Pipeline Company (Transco) purchased approximately 956 Bcf of natural gas in 1981 (2 percent more than in 1980) at an average cost of $2.63 per Mcf (25 percent more than in 1980). Transco, a subsidiary of Transcontinental Companies, Inc., has a 1,942-mile transmission system which extends from supply sources in Texas, Louisiana, Mississippi, and the offshore Gulf of Mexico area to the New York City metropolitan area. Transco serves customers in Alabama, Georgia, Louisiana, Maryland, Mississippi, New Jersey, New York, North Carolina, Pennsylvania, South Carolina, Texas, and Virginia. Supplies are augmented by imports from Canada and Mexico. Additional Canadian supplies are being acquired and connection facilities are being set up to expand supply to the New England market area. Transco sells natural gas to seven interstate pipelines, including Columbia Gas Transmission Corporation, Consolidated Gas Supply Corporation, Eastern Shore Natural Gas Company, National Fuel Gas Supply Corporation, North Carolina Gas Service, North Penn Gas Company, and Washington Gas Light Company. Transco also serves 30 large distributor customers, 33 small distributor customers, and 1 firm industrial customer.

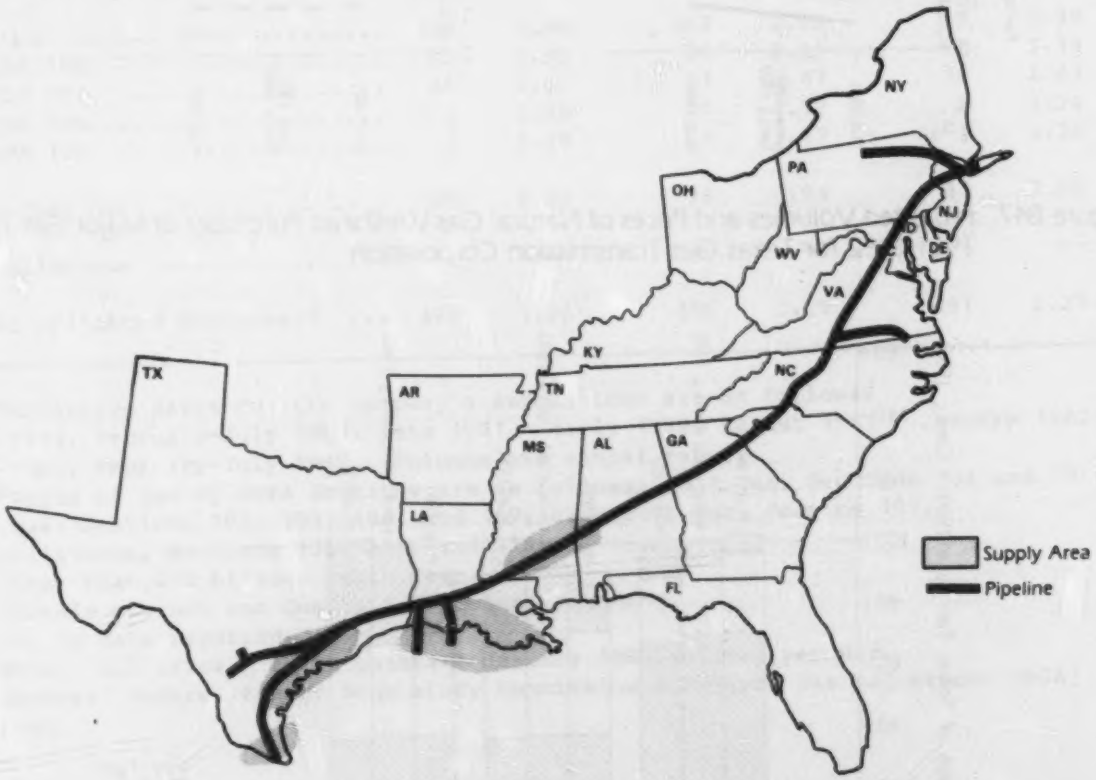


Figure B49. Transcontinental Gas Pipeline Company System Diagram

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B33. Pipeline Supplies and Purchase Prices for Transcontinental Gas Pipeline Company, 1977-1981
(Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Category	Year				
	1977	1978	1979	1980	1981
Supply Volumes					
Producer Contracts	560	571	716	893	888
Imports	0	0	0	37	31
Owned Production	0	0	0	0	0
Other Purchases	34	33	31	12	24
Total Supply	594	604	747	942	943
Average Prices					
Producer Contracts	0.64	0.86	1.34	2.07	2.60
Other Purchases[a]	0.78	1.06	1.52	2.64	3.63
Total Average Price	0.65	0.87	1.34	2.09	2.66
Domestic Reserves					
Company Owned	0	0	0	0	0
Producer Contract	4,372	4,810	5,785	5,944	5,987
Total Reserves	4,372	4,810	5,785	5,944	5,987
Reserve/Production Ratio[b]	7.8	8.4	8.0	6.6	6.7

[a]Including imports.

[b]Only company-owned and producer-contracted production and reserves are used in calculating the reserve/production ratio; imports and pipeline purchase/contract volumes are not included.

Note: See introduction to Appendix B for explanation of terms used in this table.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B34. PGA Projected Volumes and Prices of Natural Gas Wellhead Purchases for Transcontinental Gas Pipeline Company, 1981-1982 (Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
Type of Gas[b]	Volume	Average Price	Volume	Average Price	Volume	Average Price
Old Gas	323	1.60	355	1.50	363	1.57
Vintage Through 1972	141	1.15	188	1.12	165	1.17
Vintage After 1972	182	1.95	167	1.92	198	1.90
Vintage Unknown	--	--	--	--	--	--
New Gas	431	2.92	401	3.00	422	3.06
NGPA 102	404	2.95	373	3.03	395	3.09
NGPA 103	11	2.74	16	2.76	18	2.77
NGPA 108	1	3.22	1	3.43	1	3.39
NGPA 109	15	2.43	11	2.20	8	2.26
High-Cost Gas	95	6.07	88	6.94	94	7.35
Miscellaneous	(c)	2.67	(c)	2.60	(c)	2.64
Total Projected Purchases[d]	849	2.77	844	2.78	879	2.90

[a]Effective dates for the company's submissions are as follows: mid-1981, March-August 1981; late 1981 - early 1982, September 1981 - February 1982; mid-1982, March-August 1982. Volumes are annual rates.

[b]Types of gas by NGPA Sections are as follows: old gas, Sections 104 and 106; new gas, Sections 102, 103, 108, and 109; high-cost gas, Section 107; miscellaneous, Sections 105, 311, and 312.

[c]Less than 1.0 billion cubic feet.

[d]Totals may not sum due to independent rounding.

--, No data reported.

Note: All prices are in constant January 1982 dollars per Mcf.

Source: Federal Energy Regulatory Commission Purchased Gas Adjustment (PGA) Filing.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

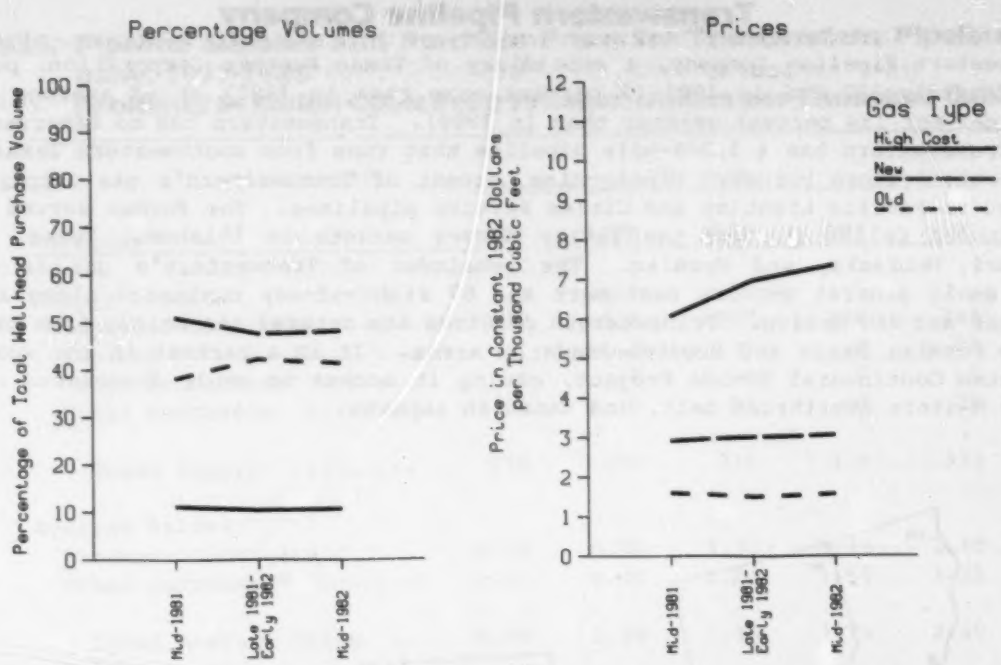


Figure B50. Projected Volumes and Prices of Natural Gas Wellhead Purchases of Major Gas Types, 1981-1982 for Transcontinental Gas Pipeline Company

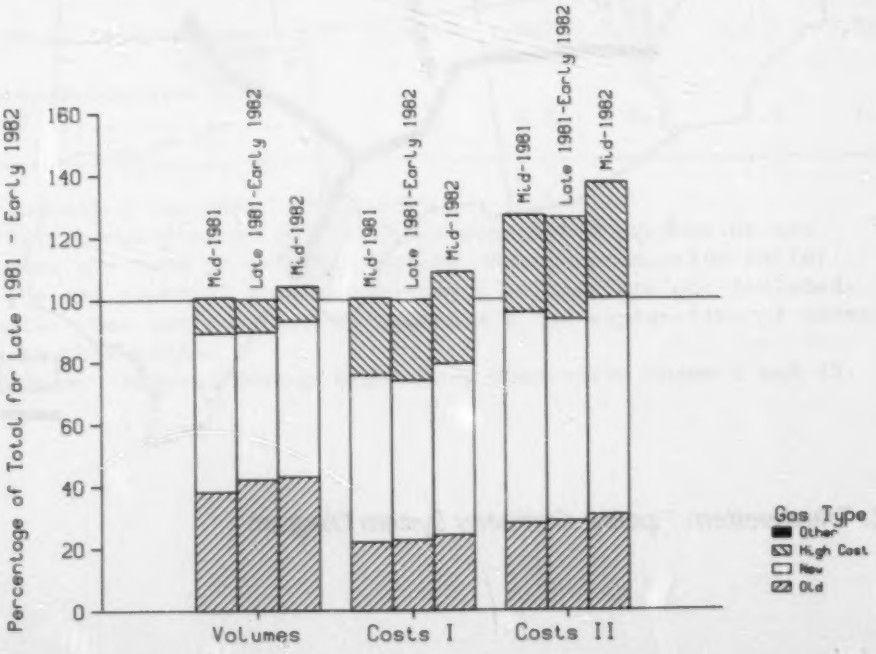


Figure B51. Projected Changes in Volumes and Costs of Wellhead Purchases of Major Gas Types, 1981-1982 for Transcontinental Gas Pipeline Company

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Transwestern Pipeline Company

Transwestern Pipeline Company, a subsidiary of Texas Eastern Corporation, purchased approximately 332 Bcf in 1981 (2 percent more than in 1980) at an average cost of $2.39 per Mcf (34 percent greater than in 1980). Transwestern has no reserves of its own. Transwestern has a 3,300-mile pipeline that runs from southwestern Texas to the California-Arizona border. Ninety-nine percent of Transwestern's gas supply is delivered to Pacific Lighting and Cities Service pipelines. The former serves markets in southern California and the latter serves markets in Oklahoma, Texas, Kansas, Missouri, Nebraska, and Wyoming. The remainder of Tranwestern's gas is sold to seven small general service customers and 67 right-of-way customers along its line in Texas and New Mexico. Transwestern receives its natural gas mainly from producers in the Permian Basin and Hugoton-Anadarko areas. It is a partner in the soon-to-be completed Continental Divide Project, giving it access to newly discovered reserves in the Western Overthrust belt, and Canadian imports.

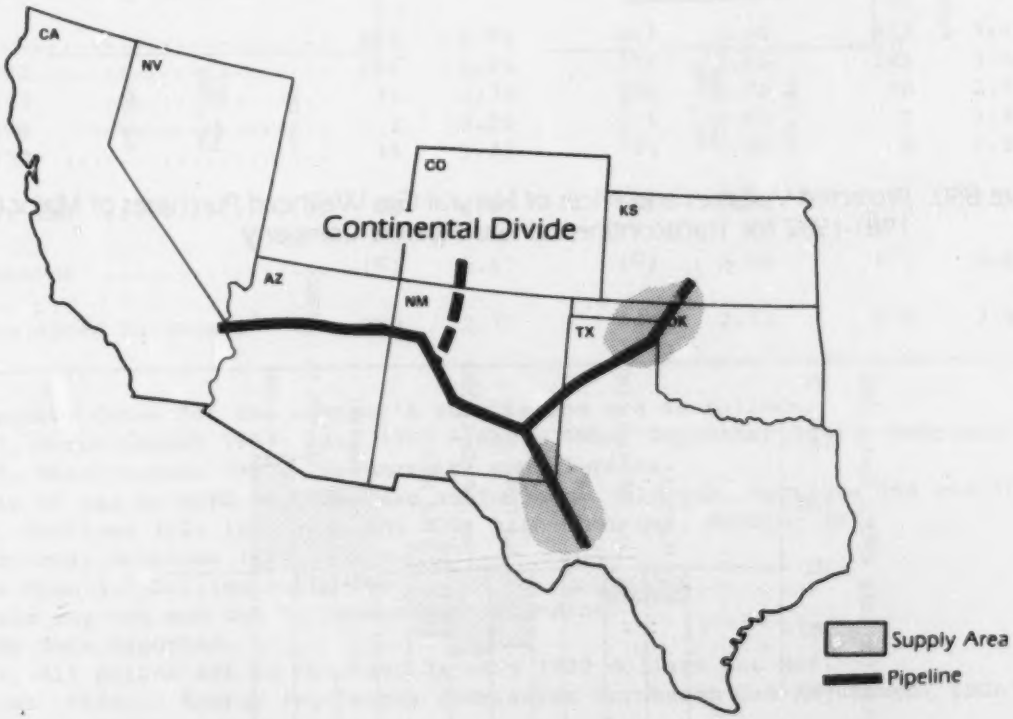


Figure B52. Transwestern Pipeline Company System Diagram

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B35. Pipeline Supplies and Purchase Prices for Transwestern Pipeline Company, 1977-1981
(Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Category	Year				
	1977	1978	1979	1980	1981
Supply Volumes					
Producer Contracts	270	235	247	248	248
Imports	0	0	0	9	10
Owned Production	0	0	0	0	0
Other Purchases	0	0	63	69	75
Total Supply	270	235	310	326	333
Average Prices					
Producer Contracts	0.70	0.76	1.14	1.45	2.10
Other Purchases[a]	0.00	0.00	2.24	2.85	3.25
Total Average Price	0.70	0.76	1.36	1.79	2.40
Domestic Reserves					
Company Owned	0	0	0	0	0
Producer Contract	1,571	1,547	1,531	1,649	1,589
Total Reserves	1,571	1,547	1,531	1,649	1,589
Reserve/Production Ratio[b]	5.8	6.5	6.1	6.6	6.4

[a]Including imports.

[b]Only company-owned and producer-contracted production and reserves are used in calculating the reserve/production ratio; imports and pipeline purchase/contract volumes are not included.

Note: See introduction to Appendix B for explanation of terms used in this table.

Source: Federal Energy Regulatory Commission Forms 2 and 15.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B36. PGA Projected Volumes and Prices of Natural Gas Wellhead Purchases for Transwestern Pipeline Company, 1981-1982 (Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Type of Gas[b]	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
	Volume	Average Price	Volume	Average Price	Volume	Average Price
Old Gas	156	0.99	143	0.98	127	0.98
Vintage Through 1972	79	0.73	63	0.72	51	0.66
Vintage After 1972	77	1.26	80	1.18	76	1.20
Vintage Unknown	--	--	--	--	--	--
New Gas	83	2.95	97	2.94	124	3.08
NGPA 102	33	3.20	41	3.21	59	3.33
NGPA 103	48	2.79	51	2.75	60	2.86
NGPA 108	1	3.43	2	2.75	2	3.15
NGPA 109	2	2.33	3	2.29	3	2.35
High-Cost Gas	3	6.10	10	5.48	46	5.98
Miscellaneous	27	2.60	18	2.54	--	--
Total Projected Purchases[c]	269	1.80	268	1.96	297	2.12

[a]Effective dates for the company's submissions are as follows: mid-1981, April-September 1981; late 1981 - early 1982, October 1981 - March 1982; mid-1982, April-September 1982. Volumes are annual rates.

[b]Types of gas by NGPA Sections are as follows: old gas, Sections 104 and 106; new gas, Sections 102, 103, 108, and 109; high-cost gas, Section 107; miscellaneous, Sections 105, 311, and 312.

[c]Totals may not sum due to independent rounding.

--, No data reported.

Note: All prices are in constant January 1982 dollars per Mcf.

Source: Federal Energy Regulatory Commission Purchased Gas Adjustment (PGA) Filing.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

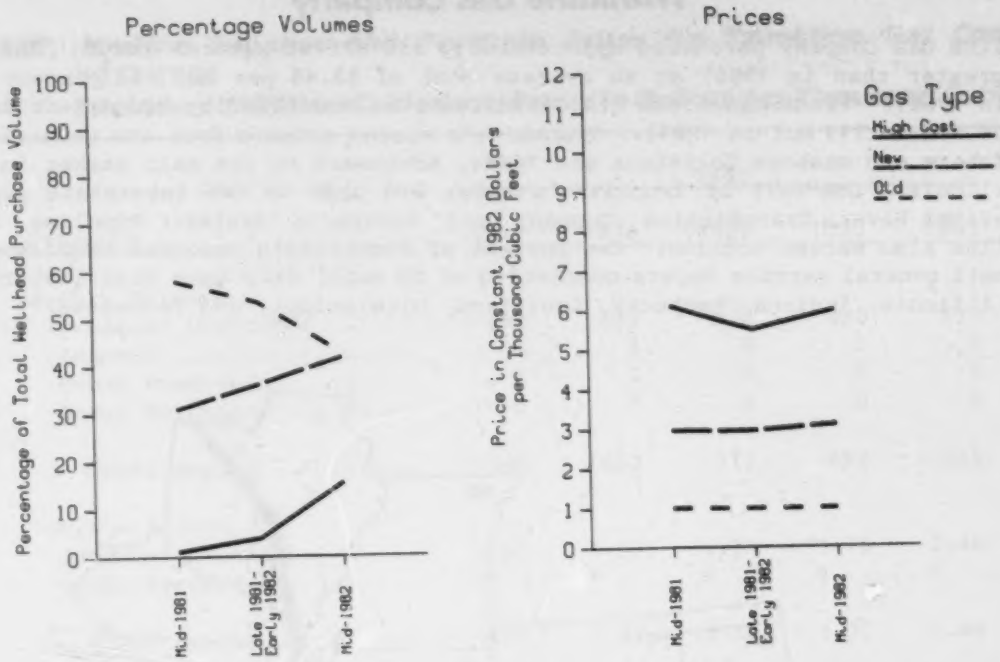


Figure B53. Projected Volumes and Prices of Natural Gas Wellhead Purchases of Major Gas Types, 1981-1982 for Transwestern Pipeline Company

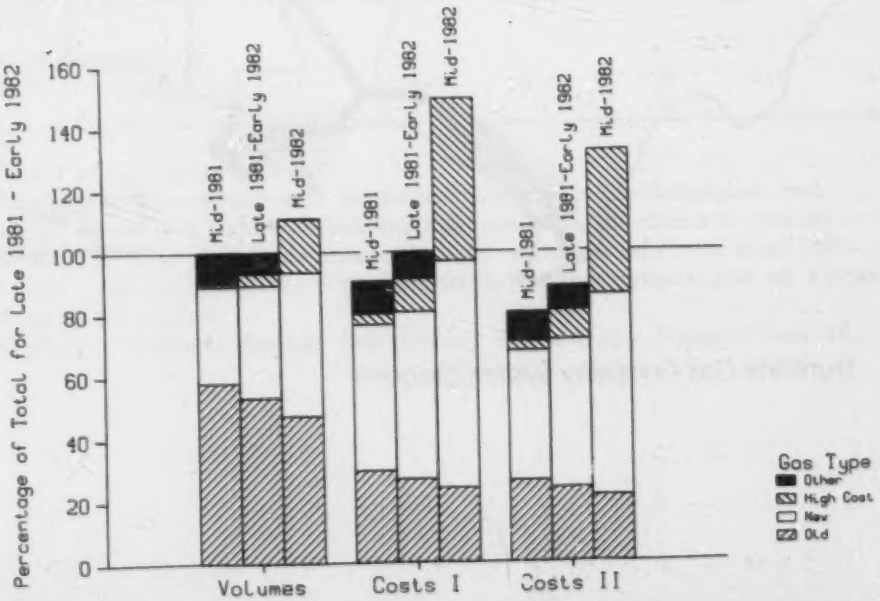


Figure B54. Projected Changes in Volumes and Costs of Wellhead Purchases of Major Gas Types, 1981-1982 for Transwestern Pipeline Company

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Trunkline Gas Company

Trunkline Gas Company purchased approximately 535 Bcf of natural gas in 1981 (9 percent greater than in 1980) at an average cost of $2.46 per Mcf (44 percent greater than in 1980). Production from its owned reserves decreased by 90 percent from 1980 (90,000 Mcf to 311 Mcf in 1981). Trunkline's system extends from its gathering lines in offshore and onshore Louisiana and Texas, northward to its main market in Indiana and Illinois. One-half of Trunkline's sales are made to two interstate pipelines: Mississippi River Transmission Company and Panhandle Eastern Pipeline Company. Trunkline also serves Indiana. Two percent of Trunkline's customer requirements are for small general service buyers consisting of 52 small city gate distributors located in Illinois, Indiana, Kentucky, Louisiana, Mississippi, and Tennessee.

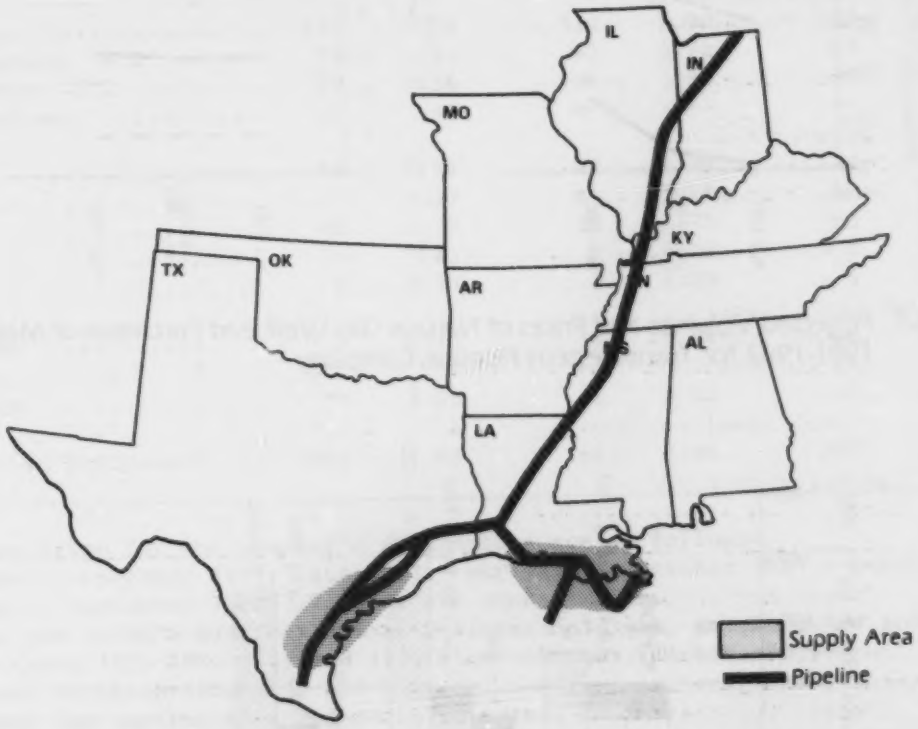


Figure B55. Trunkline Gas Company System Diagram

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B37. Pipeline Supplies and Purchase Prices for Trunkline Gas Company, 1977-1981
(Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Category	Year				
	1977	1978	1979	1980	1981
Supply Volumes					
Producer Contracts	410	452	512	492	535
Imports	0	0	0	0	0
Owned Production	0	0	0	0	0
Other Purchases	0	0	0	0	0
Total Supply	410	452	512	492	535
Average Prices					
Producer Contracts	0.81	1.03	1.38	1.70	2.46
Other Purchases[a]	0	0	0	0	0
Total Average Price	0.81	1.03	1.38	1.70	2.46
Domestic Reserves					
Company Owned	0	0	0	0	0
Producer Contract	2,019	2,286	2,474	2,501	2,430
Total Reserves	2,019	2,286	2,474	2,501	2,430
Reserve/Production Ratio[b]	4.9	5.0	4.8	5.0	4.5

[a]Including imports.

[b]Only company-owned and producer-contracted production and reserves are used in calculating the reserve/production ratio; imports and pipeline purchase/contract volumes are not included.

Note: See introduction to Appendix B for explanation of terms used in this table.

Source: Federal Energy Regulatory Commission Forms 2 and 15.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B38. PGA Projected Volumes and Prices of Natural Gas Wellhead Purchases for Trunkline Gas Company, 1981-1982 (Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Type of Gas[b]	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
	Volume	Average Price	Volume	Average Price	Volume	Average Price
Old Gas	403	1.61	391	1.69	385	1.78
Vintage Through 1972	164	1.13	155	1.23	151	1.37
Vintage After 1972	239	1.94	236	1.99	234	2.04
Vintage Unknown	--	--	--	--	--	--
New Gas	130	2.88	136	3.00	155	3.10
NGPA 102	122	2.91	126	3.02	146	3.12
NGPA 103	5	2.75	9	2.72	8	2.80
NGPA 108	(c)	2.54	(c)	3.49	(c)	3.60
NGPA 109	3	2.12	(c)	2.38	1	2.39
High-Cost Gas	58	6.78	51	7.94	49	7.93
Miscellaneous	--	--	--	--	--	--
Total Projected Purchases[d]	591	2.40	578	2.55	589	2.64

[a]Effective dates for the company's submissions are as follows: mid-1981, March-August 1981; late 1981 - early 1982, September 1981 - February 1982; mid-1982, March-August 1982.

[b]Types of gas by NGPA Sections are as follows: old gas, Sections 104 and 106; new gas, Sections 102, 103, 108, and 109; high-cost gas, Section 107; miscellaneous, Sections 105, 311, and 312.

[c]Less than 0.5 billion cubic feet.

[d]Totals may not sum due to independent rounding.

--, No data reported.

Note: All prices are in constant January 1982 dollars per Mcf.

Source: Federal Energy Regulatory Commission Purchased Gas Adjustment (PGA) Filing.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

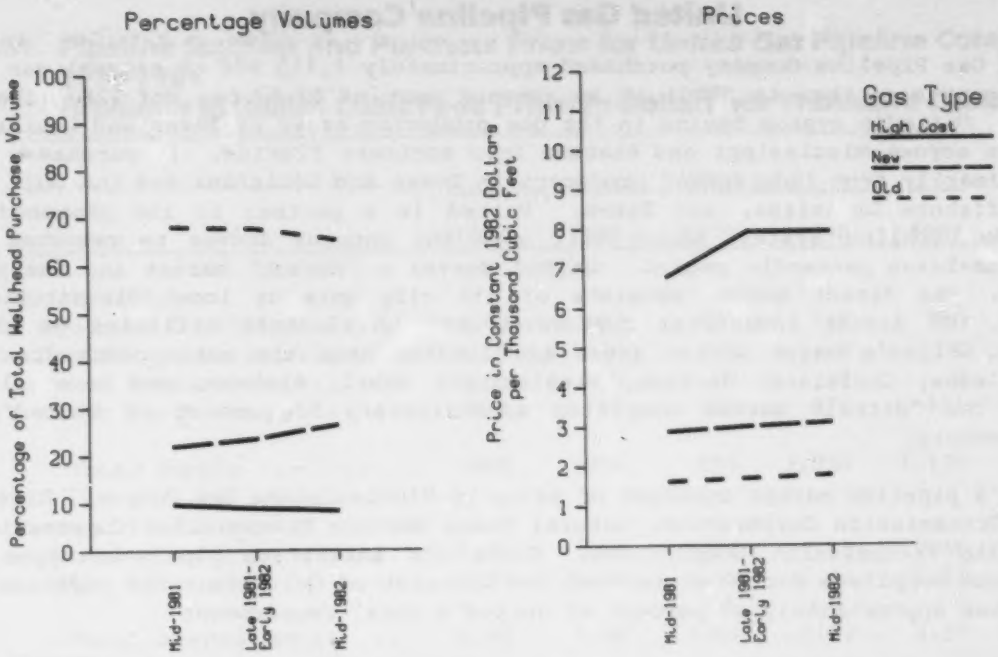


Figure B56. Projected Volumes and Prices of Natural Gas Wellhead Purchases of Major Gas Types, 1981-1982 for Trunkline Gas Company

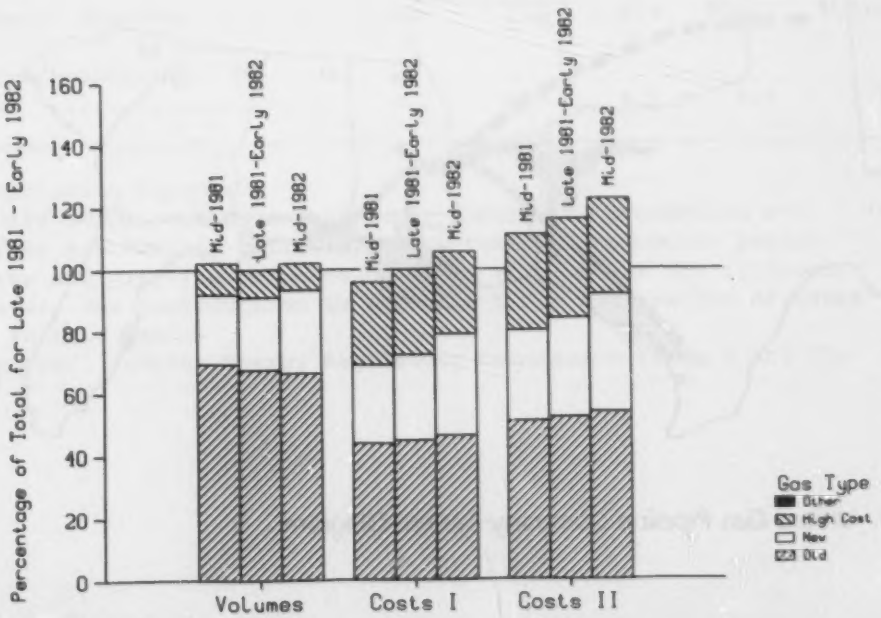


Figure B57. Projected Changes in Volumes and Costs of Wellhead Purchases of Major Gas Types, 1981-1982 for Trunkline Gas Company

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

United Gas Pipeline Company

United Gas Pipeline Company purchased approximately 1,115 Bcf of natural gas in 1981 (8 percent more than in 1980) at an average cost of $2.57 per Mcf (28 percent over 1980). United's system begins in the gas producing areas of Texas and Louisiana and extends across Mississippi and Alabama into northern Florida. It purchases natural gas primarily from independent producers in Texas and Louisiana and the Gulf of Mexico, offshore Louisiana, and Texas. United is a partner in the proposed Trans-Anadarko pipeline system, which will give the company access to reserves in the Oklahoma-Texas panhandle region. United serves a "direct" market and the pipeline market. The direct market consists of 111 city gate or local distribution customers, 167 direct industrial customers, and 12 electric utilities on the Gulf Coast. United's major market areas are located near the metropolitan centers of New Orleans, Louisiana; Jackson, Mississippi; Mobil, Alabama; and Pensacola, Florida. The "direct" market comprises approximately 53 percent of United's total requirements.

United's pipeline market consists of sales to Mid-Louisiana Gas Company, Mississippi River Transmission Corporation, Natural Texas Eastern Transmission Corporation, and Texas Gas Transmission Corporation. These six interstate pipeline companies are major gas suppliers for 22 States and the District of Columbia. The pipeline market comprises approximately 47 percent of United's total requirement.

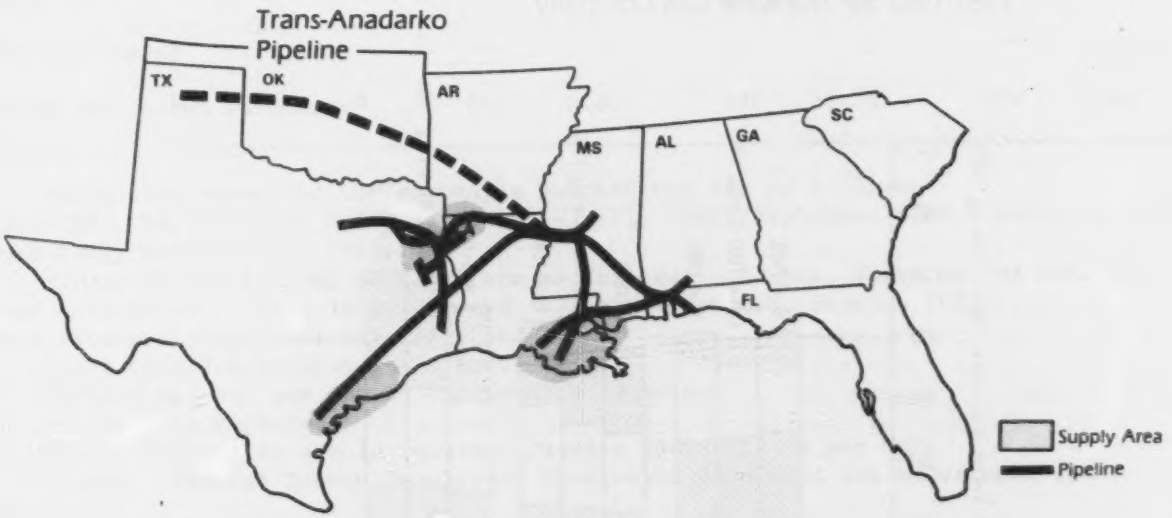


Figure B58. United Gas Pipeline Company System Diagram

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B39. Pipeline Supplies and Purchase Prices for United Gas Pipeline Company, 1977-1981
(Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Category	Year				
	1977	1978	1979	1980	1981
Supply Volumes					
Producer Contracts	644	642	671	725	765
Imports	0	0	0	0	0
Owned Production	0	0	0	0	0
Other Purchases	221	197	280	313	351
Total Supply	865	839	951	1,038	1,116
Average Prices					
Producer Contracts	0.76	1.00	1.44	1.88	2.46
Other Purchases[a]	1.37	1.38	2.02	2.34	2.83
Total Average Price ..	0.92	1.09	1.61	2.02	2.57
Domestic Reserves					
Company Owned	0	0	0	0	0
Producer Contract	2,691	2,557	2,914	2,855	2,874
Total Reserves	2,691	2,557	2,914	2,855	2,874
Reserve/Production Ratio[b]	4.2	3.9	4.3	3.9	3.7

[a]Including imports.

[b]Only company-owned and producer-contracted production and reserves are used in calculating the reserve/production ratio; imports and pipeline purchase/contract volumes are not included.

Note: See introduction to Appendix B for explanation of terms used in this table.

Source: Federal Energy Regulatory Commission Forms 2 and 15.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

Table B40. PGA Projected Volumes and Prices of Natural Gas Wellhead Purchases for United Gas Pipeline Company, 1981-1982 (Volumes in Billion Cubic Feet; Prices in Dollars per Thousand Cubic Feet)

Type of Gas[b]	Period Covered[a]					
	Mid-1981		Late 1981 - Early 1982		Mid-1982	
	Volume	Average Price	Volume	Average Price	Volume	Average Price
Old Gas	335	1.40	338	1.45	313	1.44
Vintage Through 1972	124	0.99	98	1.04	88	0.97
Vintage After 1972	211	1.64	240	1.62	225	1.63
Vintage Unknown	--	--	--	--	--	--
New Gas	253	2.93	281	3.06	326	3.13
NGPA 102	183	3.02	202	3.14	246	3.23
NGPA 103	67	2.69	74	2.88	74	2.81
NGPA 108	3	2.56	5	2.92	6	3.14
NGPA 109	--	--	--	--	--	--
High-Cost Gas	17	5.39	28	6.95	34	6.72
Miscellaneous	28	2.92	23	2.82	32	3.19
Total Projected Purchases[c]	633	2.18	670	2.40	705	2.56

[a]Effective dates for the company's submissions are as follows: mid-1981, January-June 1981; late 1981 - early 1982, July-December 1981; mid-1982, January-June 1982. Volumes are annual rates.

[b]Types of gas by NGPA Sections are as follows: old gas, Sections 104 and 106; new gas, Sections 102, 103, 108, and 109; high-cost gas, Section 107; miscellaneous, Sections 105, 311, and 312.

[c]Totals may not sum due to independent rounding.

--, No data reported.

Note: All prices are in constant January 1982 dollars per Mcf.

Source: Federal Energy Regulatory Commission Purchased Gas Adjustment (PGA) Filing.

Appendix B
Profiles of Major Interstate Natural Gas Pipeline Companies (continued)

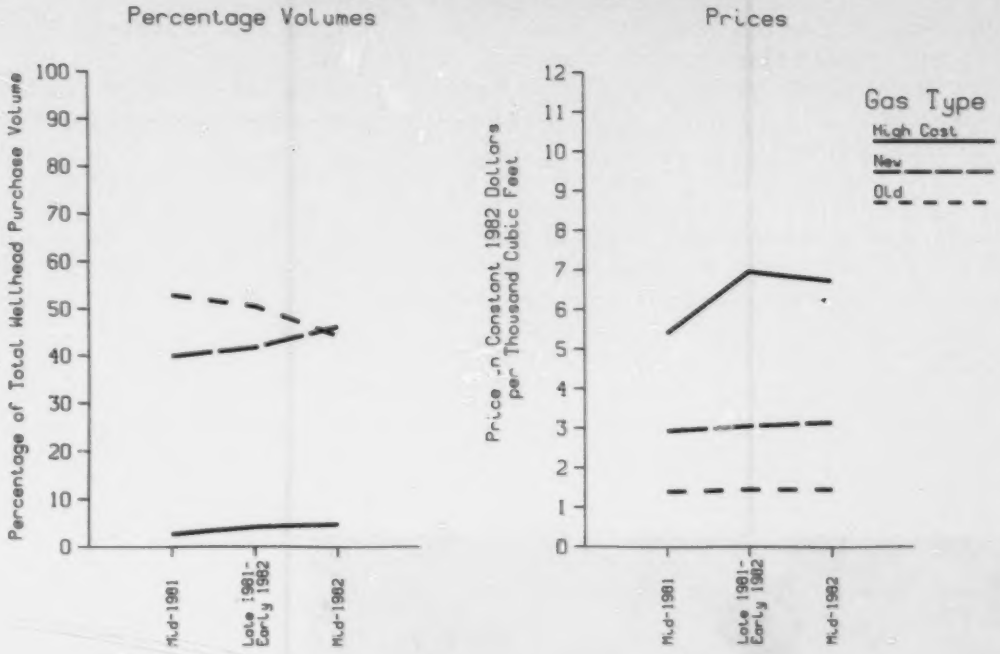


Figure B59. Projected Volumes and Prices of Natural Gas Wellhead Purchases of Major Gas Types, 1981-1982 for United Gas Pipeline Company

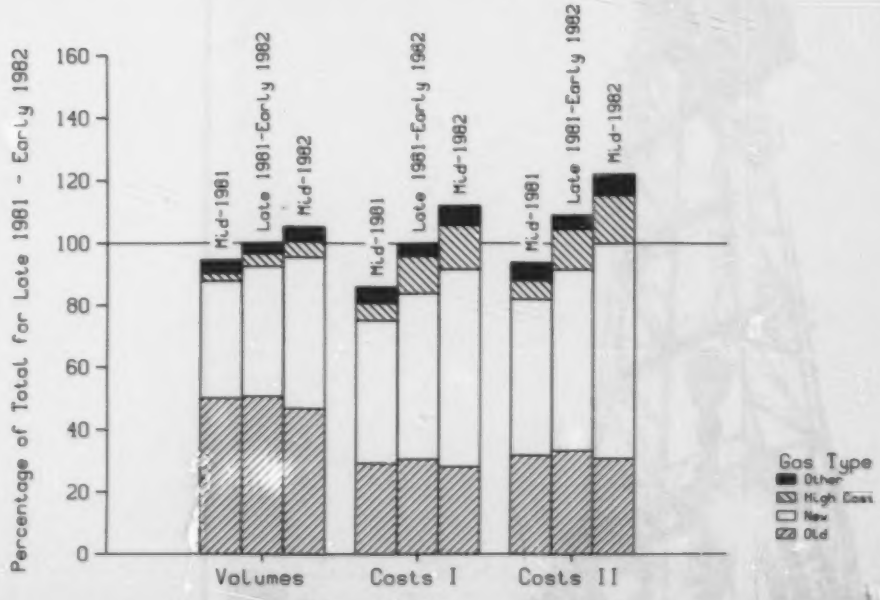


Figure B60. Projected Changes in Volumes and Costs of Wellhead Purchases of Major Gas Types, 1981-1982 for United Gas Pipeline Company

Appendix C

Sources of Supply for Major Interstate Pipeline Companies

Appendix C
Sources of Supply for Major Interstate Pipeline Companies

This study has concentrated on wellhead purchases of natural gas. Many companies supplement their wellhead purchases with gas from three other sources:

- Owned production
- Purchases from other pipeline companies
- Imports.

The purpose of this appendix is to show the relative importance of each supply source for each of the twenty pipeline companies studied (see Table C1). In the case of pipeline purchases, each major supplying company is listed separately.

Table C1. Detailed Account of Supply Sources for Twenty Major Interstate Pipeline Companies, 1980 (Volumes in Billion Cubic Feet)

Pipeline Purchaser Name	Annual Supply Volume	Percentage of Total Supply[a]																
		Owned Production	Producer Contracts	Purchases From Interstate Pipelines														
				Seller Number[b]													Other Pipelines	Import
				2	7	9	10	12	13	14	15	16	17	18	19	20		
1 Cities Service	412	0	76	0	0	0	0	0	0	0	0	0	0	14	0	0	10	0
2 Colorado Interstate ..	409	21	69	NA	0	0	0	0	0	0	0	0	0	0	9	0	(c)	(c)
3 Columbia	1,121	4	46	0	0	(c)	0	7	18	0	12	8	2	0	0	0	1	2
4 Consolidated	638	5	19	0	0	0	0	0	0	25	33	14	0	0	0	0	0	3
5 El Paso	1,291	21	67	0	0	0	0	0	0	0	0	0	0	0	0	0	11	1
6 Florida	186	0	80	0	0	0	0	0	18	0	0	0	0	0	0	0	0	2
7 Kansas-Nebraska	121	32	57	5	NA	0	4	0	0	0	0	0	0	0	0	0	2	0
8 Michigan-Wisconsin ...	691	1	80	0	0	0	0	0	0	0	0	2	0	0	0	0	12	2
9 Natural	1,016	3	83	7	0	0	0	0	0	0	0	0	0	0	0	1	6	0
10 Northern	800	2	95	1	0	0	NA	0	0	0	0	0	0	0	0	0	1	1
11 Northwest	353	11	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54
12 Panhandle Eastern	732	0	67	(c)	1	0	1	NA	0	0	0	0	0	0	31	0	0	0
13 Southern	614	2	64	0	0	0	0	0	NA	0	0	0	0	0	0	8	25	1
14 Tennessee	1,147	1	92	0	0	(c)	0	0	0	NA	0	0	0	0	0	0	3	4
15 Texas Eastern	981	(c)	60	0	0	0	0	0	2	0	NA	11	0	0	0	25	(c)	2
16 Texas Gas	420	(c)	99	0	0	0	0	0	0	0	0	NA	0	0	0	0	0	0
17 Transcontinental	919	0	96	0	0	0	0	0	0	0	0	0	NA	0	0	0	2	2
18 Transwestern	335	0	97	0	0	0	0	0	0	0	0	0	0	NA	0	0	0	3
19 Trunkline	493	0	100	0	0	0	0	0	0	0	0	0	0	0	NA	0	0	0
20 United	1,038	0	87	0	0	0	0	0	0	0	0	0	0	0	0	NA	13	0

[a]Percentages may not sum to 100 due to independent rounding.
[b]Seller number cross-references to purchaser number given in left margin.
[c]Less than 0.5 percent.
NA, not applicable.
Source: Energy Information Administration, U.S. Department of Energy. Gas Supplies of Interstate Natural Gas Pipeline Companies, 1980, DOE/EIA-0173(80). Washington, D.C., December 1981.

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